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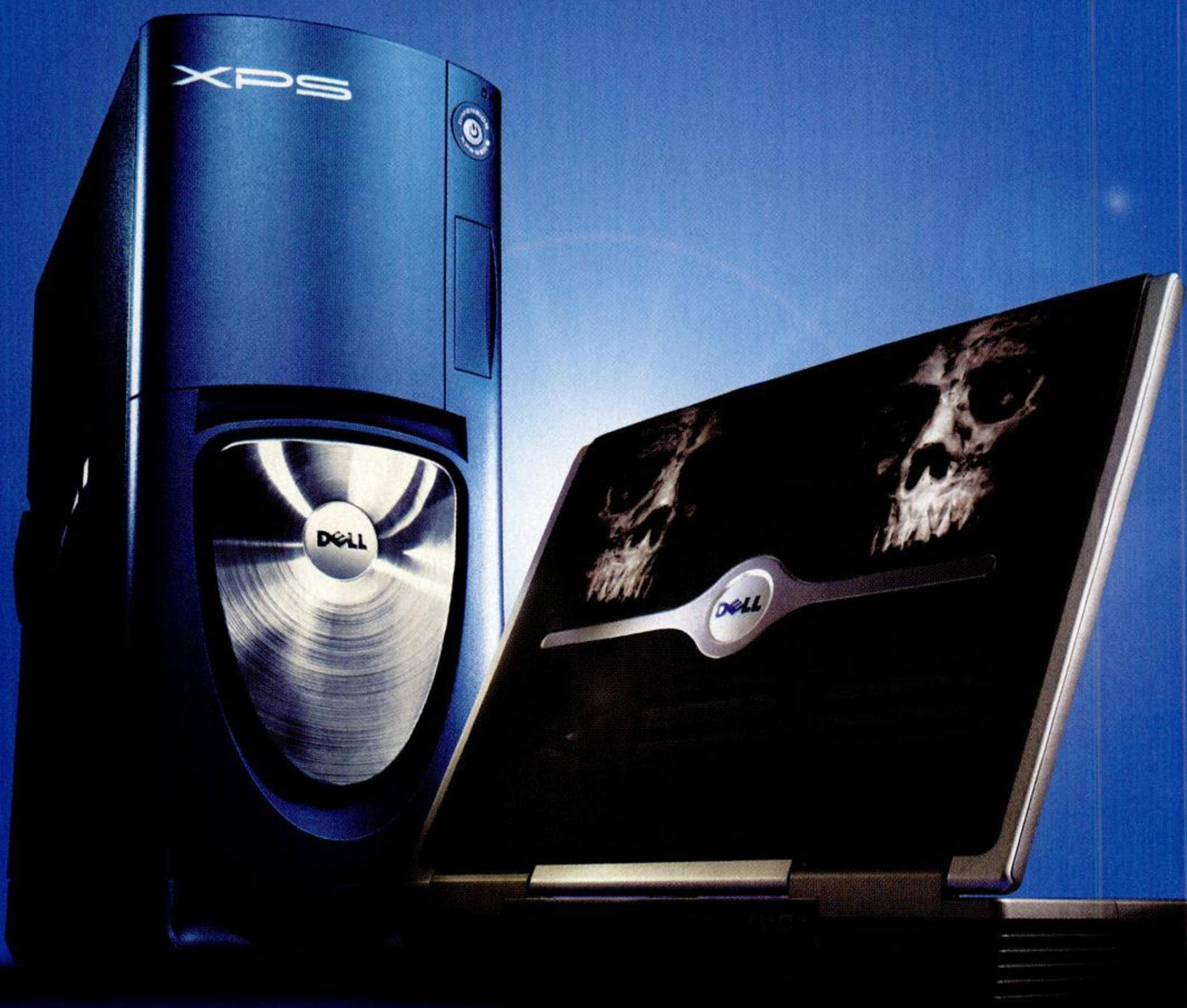

Inspiron XPS Notebook shown with Skullz design option.

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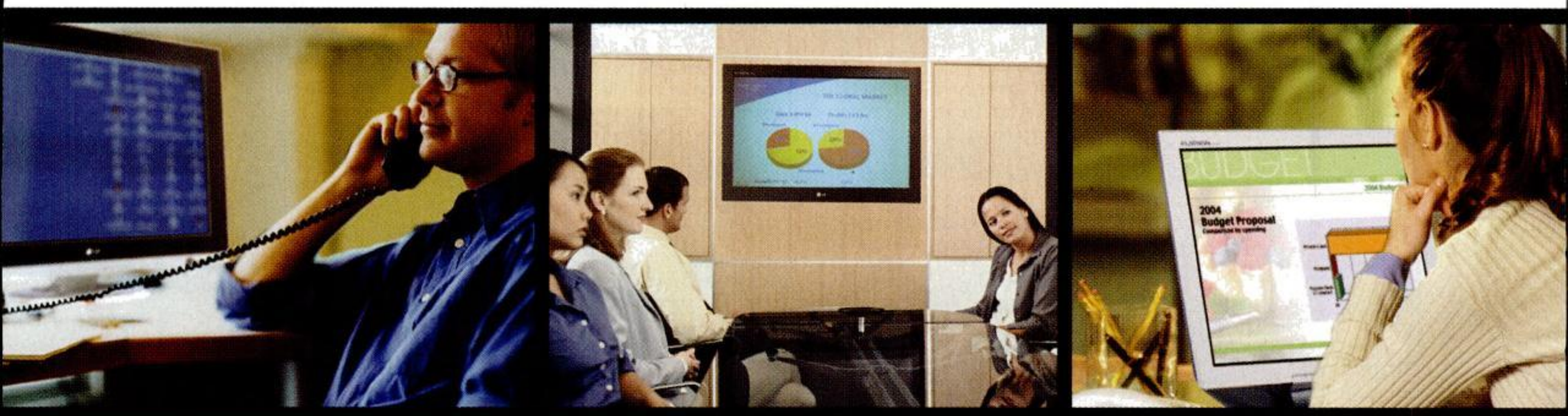

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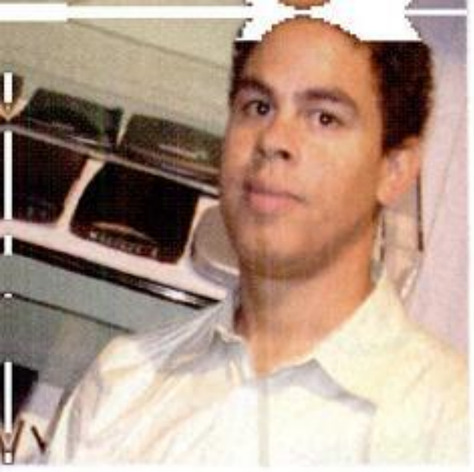

Release Notes

Windows in a Car?

Love it or hate it, the Windows OS is, has been, and, barring an almost unimaginable turn of events, will be the foundation of PCs for years to come.

But for Microsoft, the desktop is just the beginning. A big part of the company's DNA is embodied by the phrase, "Windows Everywhere." This is the notion that the Windows OS can and should migrate to all aspects of our lives.

Insert your own joke about crash bugs and blue screens here, but I don't think anyone would argue with the underlying assumptions fueling Microsoft's conviction. Barring a catastrophe that sets society back a few hundred years, technology will eventually saturate 99.9 percent of our lives. A tremendous capacity for improving efficiency, increasing comfort of living, and increasing safety makes this an evolutionary certainty.

So off we go. First comes the move into the living room, via the Media Center. It's not perfect, but, with the exception of one hyper-critical flaw—regular crashes—my tests with the WinXP Media Center OS revealed considerably more potential for managing our media-oriented lifestyles than Tivo possesses.

Apparently, the next foray is the automobile. As we went to press, Microsoft made waves with the debut of Windows Automotive. Based on Windows CE, the OS was installed in a Hummer H2 at a Detroit auto show named Convergence 2004.

Hidden under the back seat of the Hummer was a 400MHz PC with 32MB of RAM and 32MB of flash memory, outfitted with GPS and Bluetooth. The initial idea is that you'll be able to use this setup to get driving directions and connect to the Internet via wireless providers. Not surprisingly, another intended use is taking your home entertainment on the road. In time, I'm sure we'll all think of many more potential uses.

In an attempt to assuage fears that a Windows crash in an automobile could be dangerous, Microsoft went out of its way to say that the car area network concept in Windows Automotive in no way affects low-level functions like braking.

Again with the crashes. If I were ever to get five minutes with Bill Gates, I'd beg and plead that Microsoft commit itself to eliminating crash bugs for good. Rebooting a desktop PC sucks. Rebooting your home theater system, auto network, kitchen, or otherwise falls into the realm of ridiculous. Before Windows goes everywhere, it has to work all the time.

—GEORGE JONES
george@maximumpc.com

THE EIC'S PICKS

- **IN THE LAB:** Technical Editor Will Smith tests nVidia's dual GeForce 6800s in an SLI configuration. The results are mesmerizing. *Page 82*
- **PHOTO HOW-TO:** Maximum PC does cameras—our expert tips will help you unlock your camera's advanced features. *Page 73*
- **MAXIMUM PC GIFT GUIDE:** Hey, anytime you can get your IT guys into elf costumes, everyone wins. *Page 45*

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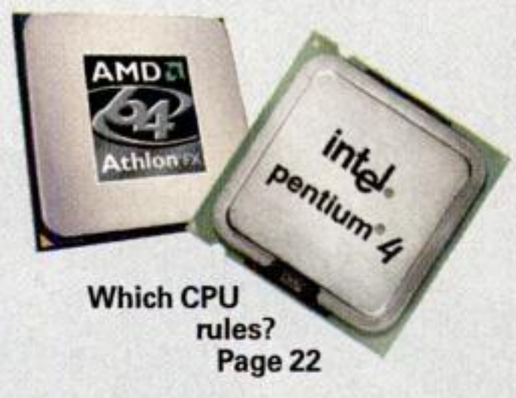

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"Handled the Rigors of DOOM3 Without Issue"
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Doom3 Hardware Guide

"10 out of 10"
Madshrimps

"Awesome"
Steamed Turtle

"The Golden Bear & 9/10"
Bjorn3D

"Delivers on its Promise"
Adrian's Rojakpot

"Unbeatable"
3D GameMan

"Best of all Worlds"
Byte Sector

"Looks Damn Cool"
SystemCooling

"A Perfect 10"
DreamStation

"Fastest DDR400 on the Planet"
OCTools

"A Low Latency Demon"
Sudhian

"A Huge Achievement... Editor's Choice"
OcPrices Hardware

"Wow... Editor's Choice"
The Inquirer

"A Bite Every Bit as Bad as its Bark... High-End Editor's Choice"
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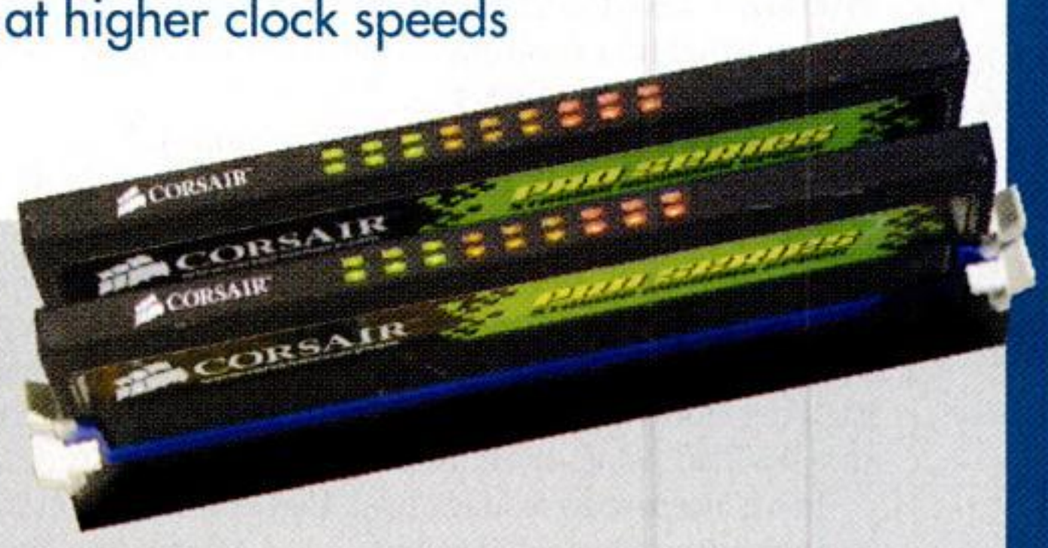

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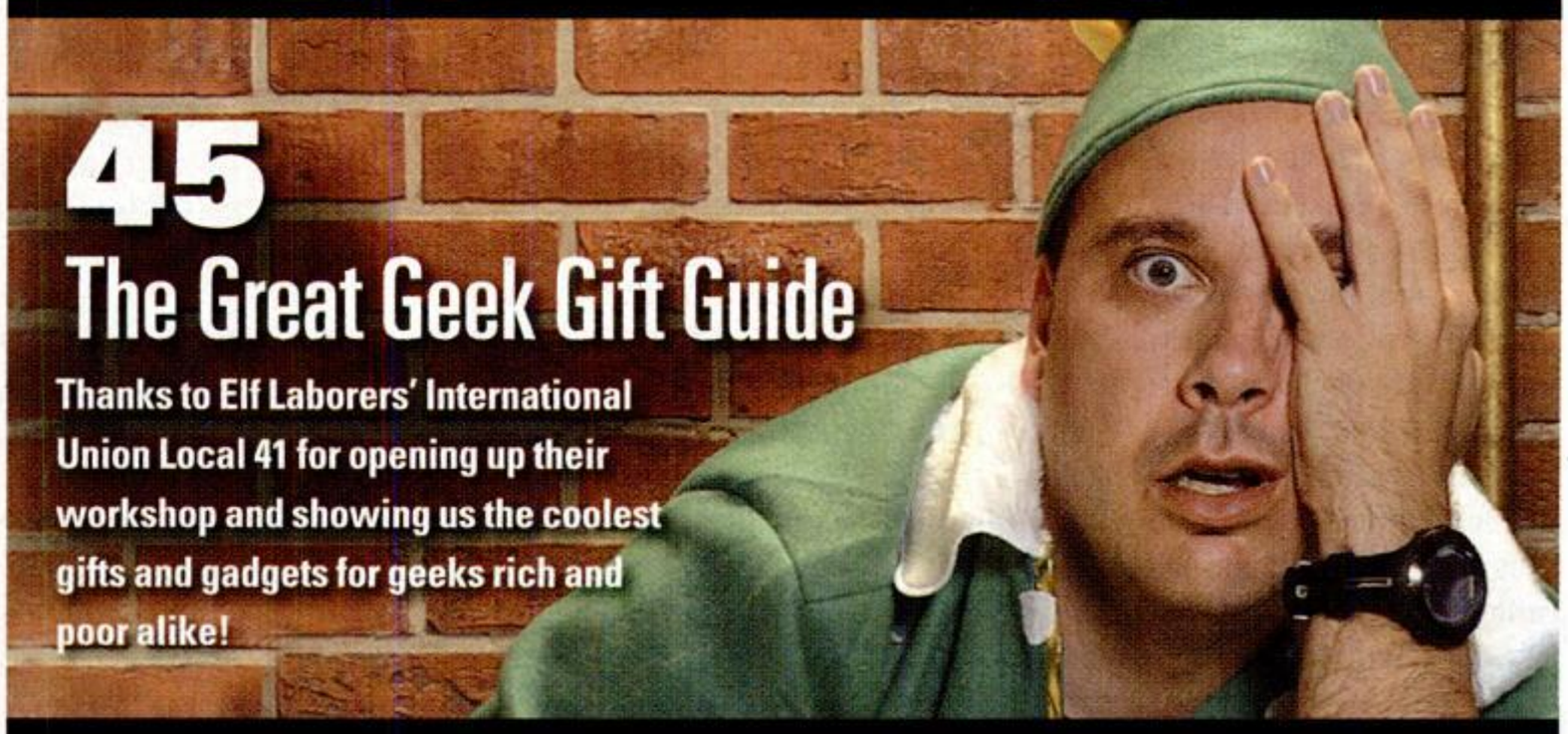

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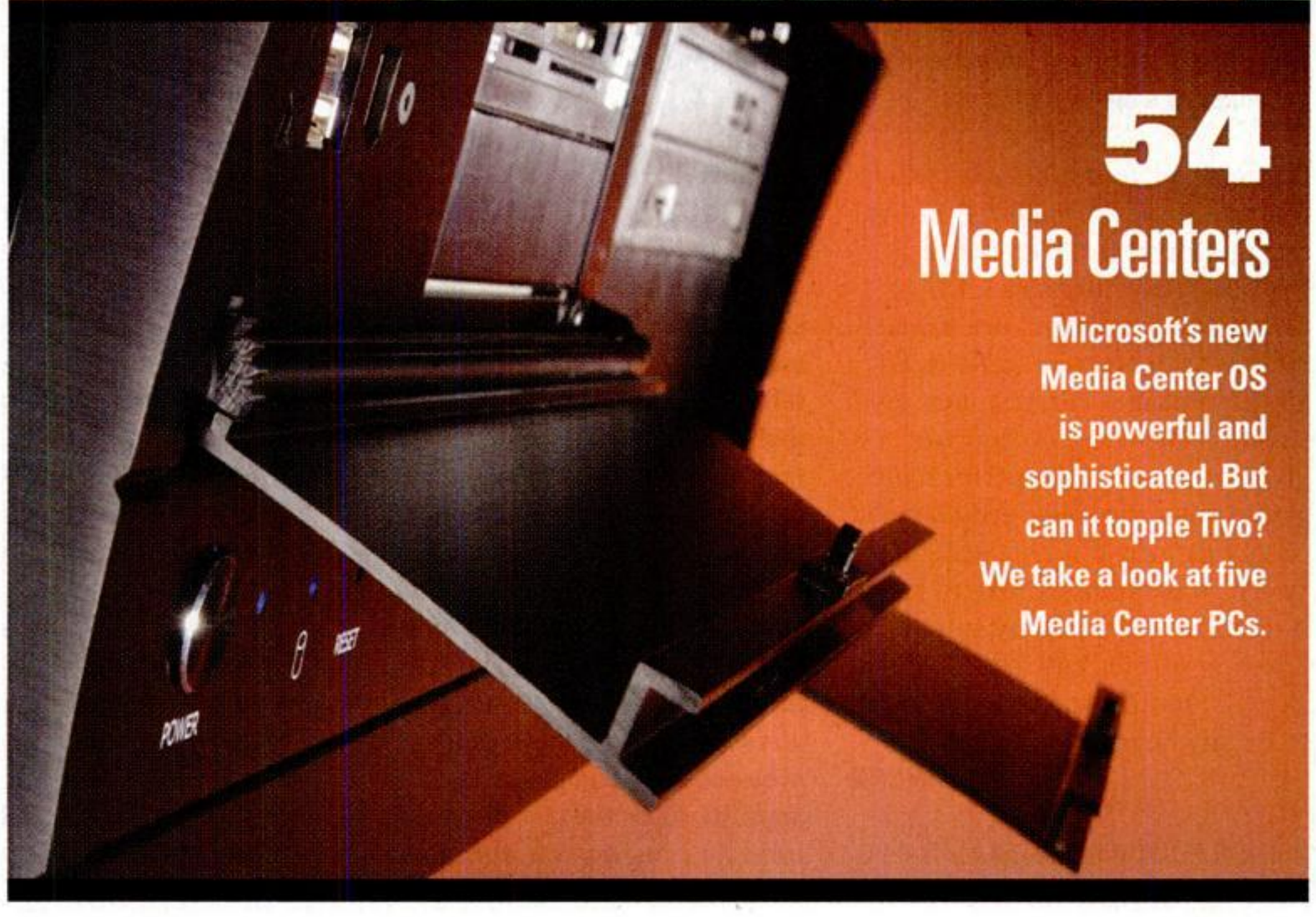

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Media Centers
Microsoft's new Media Center OS is powerful and sophisticated. But can it topple Tivo? We take a look at five Media Center PCs.

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In/Out

You write, we respond

"BUILD IT" Q&A

In your November 2004 "Build It" cover story, you recommend the Klipsch 2.1 speakers for the midrange system, and Logitech 2.1 speakers for the low-end system, but they both cost $120. Why not recommend the Logitechs for both?

Also, can you comment on the use of metal standoffs versus plastic? I'm concerned that metal standoffs provide an unanticipated and hazardous ground to the motherboard through the case given the metal-edged holes on the mobo.

—JOHN L. CASEY

TECHNICAL EDITOR WILL SMITH RESPONDS: You raise a couple of good points. First, both the Klipsch and Logitech 2.1 speakers received a 9 verdict and Kick Ass award. For all intents and purposes, they're interchangeable.

As for using metal motherboard standoffs, we wouldn't use anything else. Today's hardware is heavier than ever before, and we don't think plastic standoffs have the strength to hold heavy CPU heatsinks and videocards. Furthermore, because the main ground for the motherboard is connected to the power supply, which is grounded to the case, there's nothing fundamentally dangerous about using metal standoffs to connect the mobo to the case.

A sidebar in your "Build It" article touched on BIOS/memory timing changes. It stated, "Manually tweaking your memory settings can yield big performance gains," and mentioned *MemTest86* as an application that can test memory stability. However, no app was given to measure the performance gain. I tried the suggested changes on my gaming PC, and while my system was stable, I'd like to know if the changes made my system faster. I ran the time demo in *Doom 3*, but there doesn't appear to be any change.

—RICH BRENNAN

SENIOR EDITOR GORDON MAH UNG RESPONDS: A good free test for memory bandwidth can be found in *SiSoft Sandra* (www.sisoftware.net). Don't rely solely on synthetic tests, though—you need to measure real-world results. You can verify the immediate impact of lower-latency RAM by running the *Quake III Arena* time demo at a low resolution before and after you make your memory timing changes. We've found *Doom 3* to be primarily videocard dependent, and because systems can't run it all that fast, we have yet to see any difference in RAM timings with the game.

Generally your how-tos are spot on, but your "Build It" story conflicts slightly with what I've found to be the best order to install components when building a PC. Namely, you suggest installing the mobo in the case and then installing the CPU and RAM. In my experience, it goes much smoother if you install the CPU, heatsink/fan, and RAM prior to installing the mobo into the case. Once the motherboard is in the case, getting the CPU in is a snap to be sure, but placing the heatsink/fan inside the case can be problematic at best, and impossible at worst.

—KELLY WHITE

TECHNICAL EDITOR WILL SMITH RESPONDS: This is one of those situations where sometimes it's right to do things one way, and sometimes it's right to do them another. We specifically chose to tell people to install their memory and CPU heatsinks in the mobo after they screw the mobo into the case for one reason alone. With quite a few cases—especially those that use slide-out mobo trays—installing the mobo after the CPU heatsink is installed is impossible. Furthermore, installing the CPU heatsink, then wrestling the board into place in a cramped case can put as much or more stress on the mobo as would installing the heatsink and memory once the board is inside the case.

IS THAT WHY THEY CALL IT A CLEAN SUIT?

The line saying, "Chipmakers often go commando under their bunny suits," on page 57 of your "Birth of a CPU" article (November 2004) was PRICELESS. I practically fell out of my chair laughing—try explaining that to your coworkers! I wondered how many people noticed?

—DAVID RENNICH

EDITOR IN CHIEF GEORGE JONES REPLIES: Congrats on being the first to e-mail us regarding our little Easter egg, David. As a reward, we're going to send you a copy of each of our recently released *Maximum PC* books—*Maximum PC 2005 Buyer's Guide, Maximum PC Guide to Building a Dream PC,* and *Maximum PC Ultimate PC Performance Guide.* We're also going to throw in a copy of our recent 3D Gaming special issue. All items are on sale now.

DRM: WE'RE GETTING SCREWED

Thanks for your very informative article about digital rights management ("Deciphering DRM," November 2004). Let's see if I've got this straight: I can buy songs from iTunes but I might have to ask some server's permission to listen to them. I can buy a DVD-video disk but I have to be an expert on the DMCA to know that it's illegal to use decryption tools. I can buy songs in the WMA format but my player may not support its use, and usage permissions vary from vendor to vendor. I can buy a CD, but might not be able to play it on my PC, and the copy protection technology might crash my system if I try. I can buy a game but if I try to use it on a virtual drive, chances are it won't work. It does seem a little strange that the RIAA can't figure out why sales are dropping like a stone! Personally, my purchasing has dropped by at least 80 percent.

—RICK MCDANIEL

FEATURES EDITOR LOGAN DECKER RESPONDS: Let's see... you forgot one more gripe: The most popular music downloading services all use different audio compression formats, and there's *no* digital audio player out there that supports them all.

It's a sad state of affairs, but for now all we can do is let our wallets express what kind of digital rights management we're

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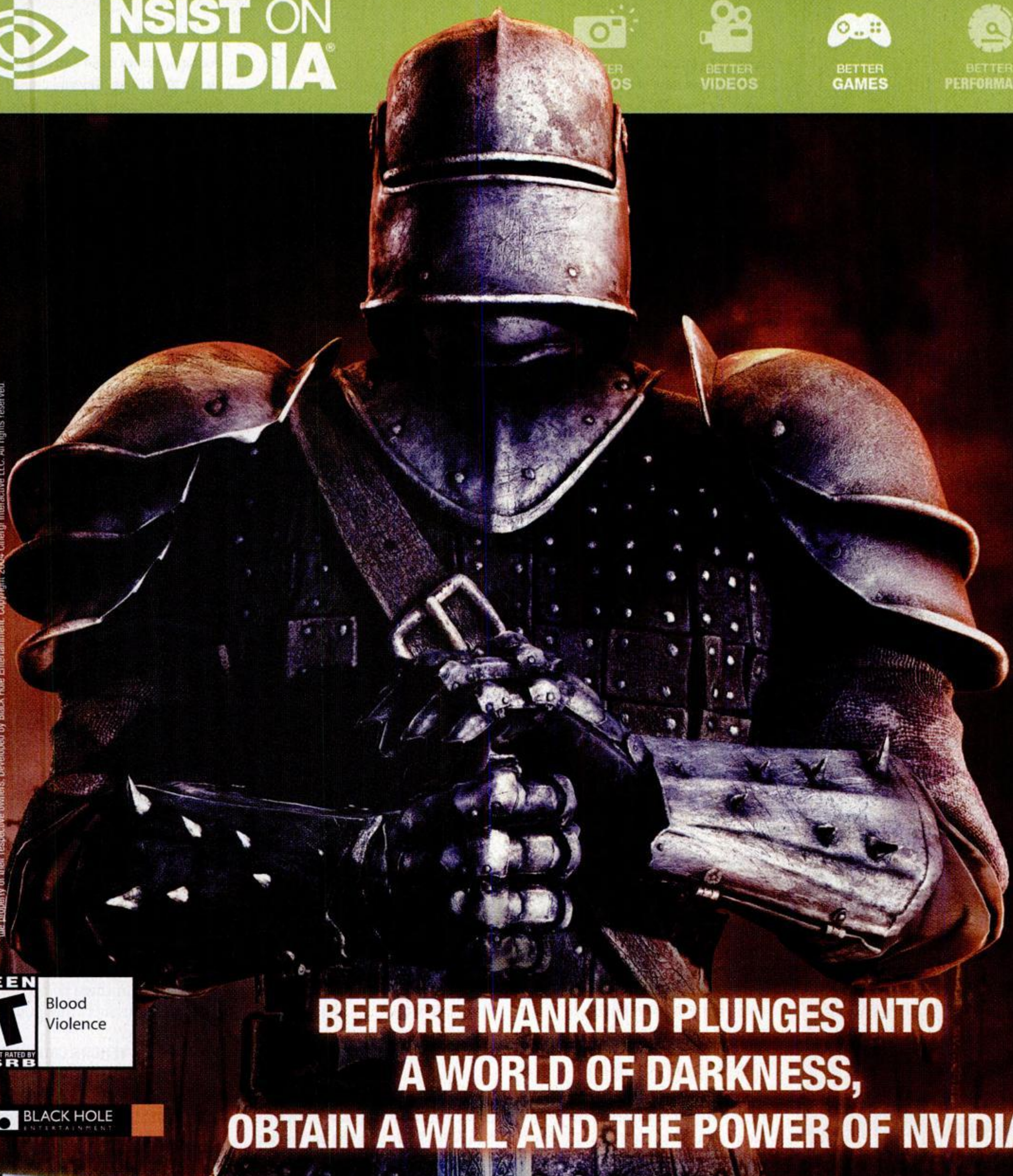

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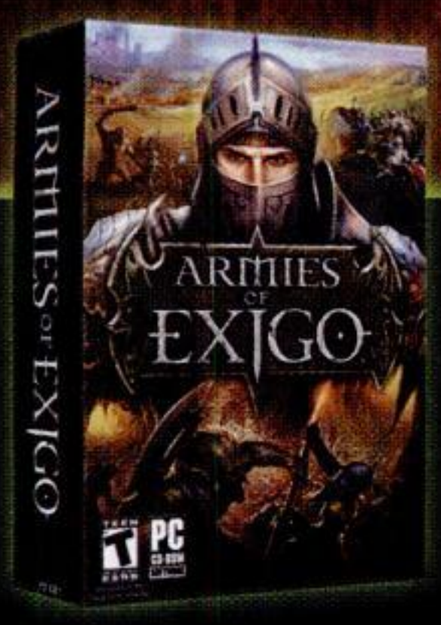

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COMING NEXT MONTH IN THE HEY-WE'RE-ONE-HUNDRED! JANUARY ISSUE OF MAXIMUM PC

BIG GIGANTIC TECHNOLOGY PREVIEW

Take a look at the gear of *next* year! Concepts that were once little more than geek bedtime fantasies are finally arriving, and *Maximum PC* reports on which ones to expect in 2005, and how they're going to affect PC power users.

HALF LIFE 2: THE REVIEW!

***Maximum PC* staff were among the first to play the astounding sequel to *Half-Life*. We give you an exclusive look under the hood of Valve's Source engine, and you'll get our definitive, no-mercy review of the most anticipated PC game in history!**

POWER SUPPLY TORTURE TEST

Seven big-rig power supplies are put through a gauntlet of non-UN approved "interrogations." We sweat them, deprive them of stable power, and stress them to their very limits. Wait until you see which manufacturer's PSU comes out on top.

100 Issues of Unreasonably Harsh Reviews!

That's right—January 2005 marks the 100th issue of *Maximum PC*! Check out the highlights.

willing to accept, and let our legislators know how we feel about bills (such as the DMCA and the INDUCE Act) that restrict our rights in order to prop up aging business models.

And if you think the recording industry's response to online music sales is pathetic, check out www.cinemanow.com, the first movie downloading service to get Hollywood's blessing. You can tell how much the motion picture industry is committed to fighting illegal downloads with legitimate purchases by checking out the premium pay-per-download content on the front page of CinemaNow's web site—*Bumfights*.

DOES THIS MEAN YOU LIKE THELMA, TOO?

In the verdict box for the AA8 Duramax review (November 2004, page 80), you have Ginger as the "+" and Mary Ann as the "–". These are clearly reversed! I've heard there are people who prefer Ginger to Mary Ann, but they aren't normal. Perhaps you could make the negative Mrs. Howell. That would be pretty clear cut.

—STUART BOREEN

EDITOR IN CHIEF GEORGE JONES RESPONDS: Stuart, we went back to the show's archives and came to this conclusion: You're right. Senior Editor Gordon Mah Ung fought us on this one, but after being forced to undergo a rigorous, 24-hour *Gilligan's Island* marathon, he now admits to the error of his ways. Unfortunately, during the course of his reconditioning, Gordon developed the really annoying habit of referring to everyone as "little buddy."

APPLE ERRATA: OUR BAD

I just wanted to let you know that I spotted an error in your November issue ("Deciphering Digital Rights Management"), where you state that Apple allows users to authorize up to three computers for songs downloaded from the iTunes Music Store. While this was our policy previously, we now allow users to authorize up to five computers. And by the way, was that a scene from *Battle Royale* on the screen of the Portable Media Center from Creative Labs (reviewed on page 93)?

—JAY DAVIS, APPLECARE SUPPORT

FEATURES EDITOR LOGAN DECKER RESPONDS: Thanks for writing, Jay—our apologies. We weren't aware that Apple increased the number of PCs that could be simultaneously authorized to play back tracks purchased on iTunes. That's awesome, and is a more generous policy than that offered by Napster, for example, which still restricts your downloads to three simultaneous PCs.

And yes, that was *Battle Royale* (Winner, Best Picture, *Maximum PC* Movie Awards 2001-3) on the portable media center thingy. We don't know how those VOB files got on our hard drive, but there they were, so we converted them to WMV.

Finally, we're delighted to acknowledge *Maximum PC's* fans over at AppleCare Support.

RAID GAMING PERFORMANCE: DID YOU TRY EVERYTHING?

This is in regards to your October 2004 "In the Lab" story regarding RAID's inability to accelerate game-level load times because of the CPU-oriented decompression that occurs in most games. Have you tried un-zipping all the .pk3 files on your *Doom 3* install and then checking level load times? When *Doom 3* is loading, it has to unzip all those .pk3 files, which probably puts a huge load on the CPU vs. disk I/O.

—JOON YOO

SENIOR EDITOR GORDON MAH UNG RESPONDS: We actually did this for the RAID test, and it didn't help. Our tests revealed that unzipped pak files actually took longer to load than compressed files. My suspicion is that, much like drive imaging, you get better overall I/O decompressing a file after it's been moved than decompressing a file and leaving it on the hard drive. Say you can get 50MB/s moving an uncompressed file (the maximum straight throughput of a single drive). You can probably get 60MB or 70MB by reading the compressed file and decompressing it on the other side. Of course, this assumes you're using a somewhat powerful CPU. We used a 3.2GHz P4 with 1GB of RAM for our testing.

IN DEFENSE OF TWO GIRLS KISSING

I'm writing to express my sympathy to you and your fellow editors who have to field letters like the one from Clint Guillory printed in the Nov. '04 issue. It truly baffles me how someone can be so narrow-minded as to take offense at an excellent and humorous review (October 2004's review of *Singles: Flirt Up Your Life*). Who is he accusing of being "horny kids"? It's obvious Clint is the one who needs to grow up. Trust me, the majority of your readers don't agree with the extreme jerks.

—JOE HARRIGAN

SAVE THE HIPPOS!

When I opened up the November issue and turned to the graphics card review to check out the hippopotamus trivia [typically found in the text beneath the benchmark chart], I was shocked to see that the trivia is being discontinued. How can you do this to us? That was one of the best parts of the whole magazine. Can there be no more hippopotamus facts that you could include?

—YEHUDA CRUZINBRITZ

HIPPO AFICIONADO WILL SMITH RESPONDS: I have one word for you, Yehuda: wildebeests. Oh, by the way, did you know that hippopotamus babies are called calves and weigh about 66 pounds? That's a big baby. ■

LETTERS POLICY: *MAXIMUM PC* invites your thoughts and comments. Send them to input@maximumpc.com. Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

CUT, COPY, PASTE

➤ In our October review of the Falcon Northwest Mach V Exotix, the clock speed of base CPU was incorrectly identified by the vendor as a 3.8GHz Pentium 4. Falcon Northwest says the CPU it used to overclock with was actually a 3.6GHz Pentium 4 560.

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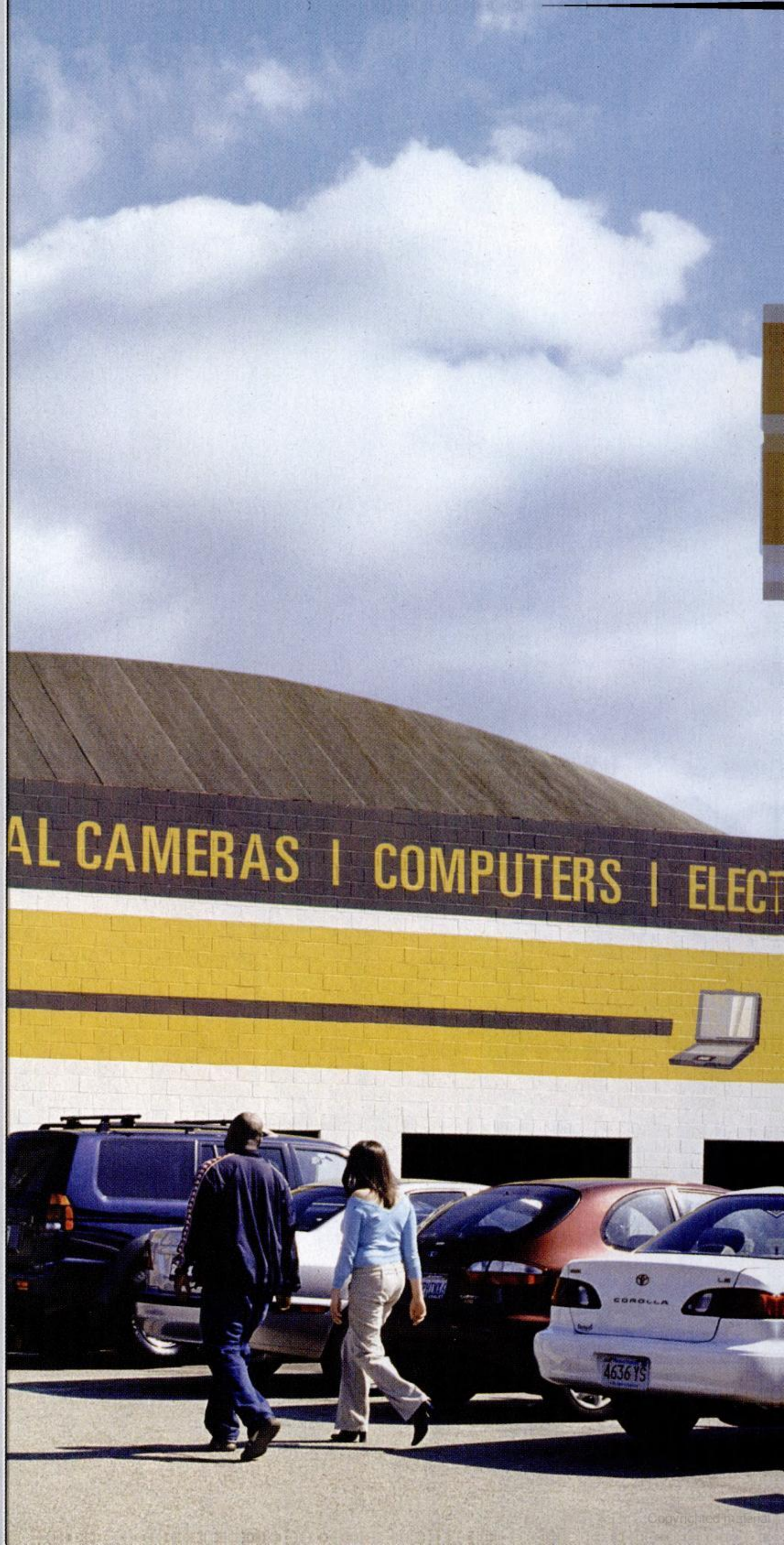

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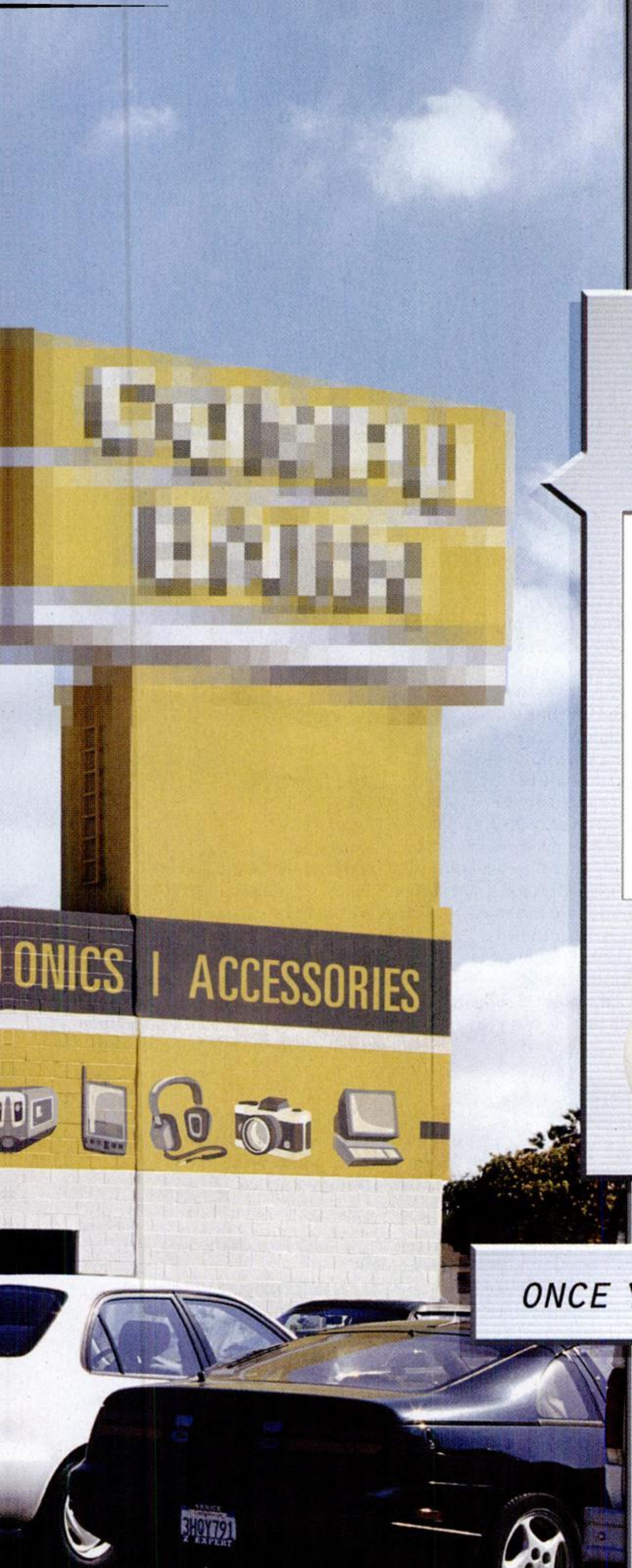

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QuickStart

The beginning of the magazine, where articles are small

Tour de nForce4!

nVidia bakes up a brand-new chipset that delivers massive power and immense functionality. *Maximum PC* takes a bite

After seeing the fourth-generation nForce motherboard in action, we find ourselves wondering if nVidia subscribes to the prevailing theory regarding the quality of Star Trek movies: Only the "even" numbers are worth a damn.

When released—nVidia says it should be available by the time you read this—the nForce4 chipset will be the only consumer chipset to support nVidia's revolutionary SLI technology, which combines two videocards in a system for unprecedented graphics-processing muscle. (For details on SLI, turn to page 82.) Up until the nForce4, SLI could only be used with Intel's E7525 Xeon-class chipset, which usually meant the motherboard cost in excess of $400. The nForce4 chipset, which should appear in mobos in the $200 range, will be compatible with Athlon 64/FX/Sempron only, but will support both Socket 939 and cheaper Socket 754 motherboards.

But the nForce4 is about much more than just SLI; it will also be the first chipset with native support for next-generation 300MB/s SATA drives that include native command queuing and hot-swappable capabilities. The nForce4 chipset can even tell you if a SATA cable has been knocked loose and where the loose connection is located on the motherboard. Like the nForce3 250GB, Gigabit Ethernet will be integrated into the chipset, but now with a beefed-up firewall that features a friendlier GUI. True hardware packet inspection for increased network security will also be included.

Still, the most anticipated feature—the one that has us drooling down our *Maximum PC* bibs—is affordable SLI support. nVidia's spin on SLI will include two x16 slots on the motherboard. Because the north bridge supports only 20 PCI Express lanes, nVidia will configure the chipset for two modes. The first is the standard configuration where one of the x16 PCI Express slots operates in x16 mode. When you decide to add a second videocard, you'll throw a hardware switch on the board that will reconfigure the board to operate both

nVidia Ditches Audio Unit

Is hardware audio acceleration dead?

nVidia never released its Sound Storm Pro bay, which was similar to Creative's Audigy 2 Drive.

A field that's been shrinking for years just got even smaller. nVidia has officially thrown in the towel on PC audio, telling *Maximum PC* it has eliminated its audio division and has no plans to introduce stand-alone audio hardware.

The public word officially deep-sixes hopes that the company would export the advanced Dolby Digital processing from the original nForce and nForce2 into a PCI Express soundcard. While the nForce/nForce2 audio was a cult hit, the core never won the hearts of mainstream consumers or manufacturers, who had difficulty understanding its capabilities. As a result, audio acceleration was yanked completely from the nForce3 core. But for months the company had strongly hinted at plans to offer a stand-alone PCI Express product based on the technology. With the dissolution of the audio group, those plans are gone and nVidia joins Aureal, VLSI/Philips, and ESS Technology as companies that see no future in PC-based hardware audio acceleration. "It's dead, it's never coming back," one nVidia spokesman told *Maximum PC*.

With CPUs throttling up, 64-bit capabilities on the horizon, and the imminent arrival of dual-core CPUs, it's easy to argue that the need for a dedicated DSP to process audio is going, going, gone. A further blow to 3D audio acceleration came a few months ago when id's *Doom 3* adopted a CPU-based audio engine. Valve's upcoming *Half Life 2* and GSC's *S.T.A.L.K.E.R Shadow of Chernobyl* are also expected to feature their own host-based audio processing instead of relying on DirectSound3D.

Microsoft officials say they're not troubled by developers building their own audio engines; they also say that future versions of DirectX audio will include improvements that will help game developers implement host-based audio. Despite the lack of hardware, Microsoft will continue to support audio acceleration as well as the move toward host-based audio.

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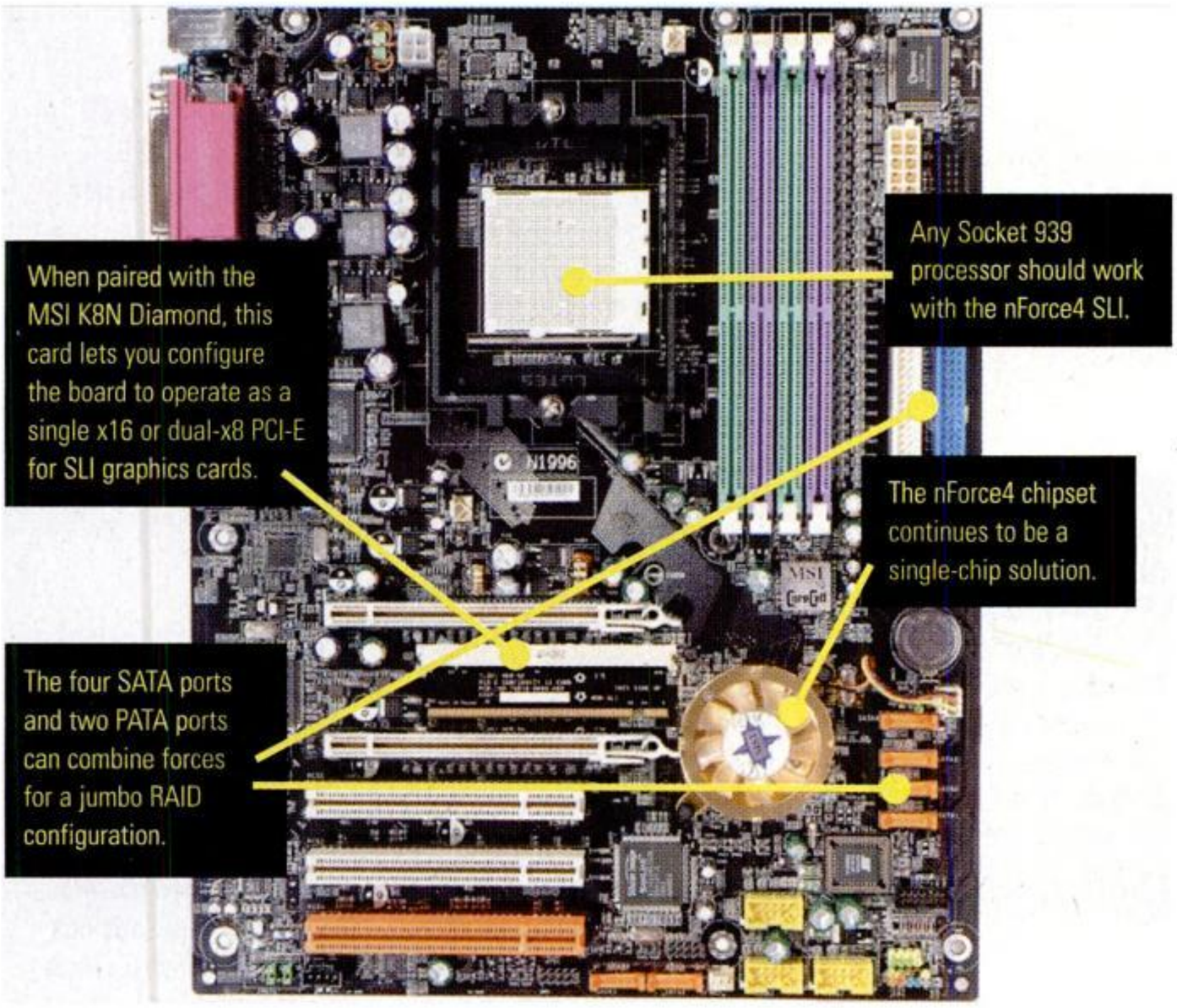
What's new in nForce4



x16 slots as x8. Why not operate both slots at true x16 modes? nVidia says there are two reasons. The first is that there is no need for today's—and probably even tomorrow's—hardware to require that much bandwidth. The second reason is the electrical challenge of building a chipset with 32 or more PCI Express lanes; extra lanes require the chipset to have additional contact pads—the electrical contact points that must be soldered to the motherboard. With 32 lanes, the amount of contact points would make the chipset pretty unwieldy, size-wise, which may explain why no PCI Express chipset we've seen to date supports more than 20 PCI Express lanes.

Despite rumors that SLI will require identical PCB boards and chip versions to operate, nVidia officials tell *Maximum PC* that the only requirement for pairing up videocards is that the cards be of the same family. That is, you will have to mate a 6800 GT with a 6800 GT—not a 6800 Ultra.

The nForce4 chipset will be introduced in three versions: an SLI version that supports all the chipset's features, an Ultra version that lacks SLI, and a stripped "mainstream" version that's so basic you won't even get the SATA 3GB/s support or the firewall.

Whither VIA?

nVidia's competitor makes big plans for PCI Express

VIA isn't standing still while nVidia rolls out its fancy-pants hardware. While we've yet to see any actual parts, the company was the first to announce a PCI Express chipset for the Athlon 64/FX platform with the K8T890.

Unlike nVidia's ultra-low latency single-chip solution, the K8T890 is a traditional north bridge/south bridge configuration. VIA makes 20 PCI Express lanes available in the north bridge and two in the south bridge, which the company says allows motherboard vendors to make flexible choices, like plumbing LAN or an HDTV tuner directly to a PCI Express lane in the north bridge. VIA also says it will support dual PCI Express cards in a Pro version of the chipset, but it's not clear yet if the company has the blessing of its arch-rival nVidia. Finally, a version of the chipset that supports dual video cards for the Pentium 4 called the PT894 Pro is also in the works for later this year.

FAST FORWARD BY TOM R. HALFHILL

Digital Cameras Defy Moore's Law

We're so accustomed to seeing microprocessors and memory chips get faster, cheaper, and smaller that it's easy to believe Moore's law applies equally to all chips. But there's an interesting exception: image sensors for digital cameras.

Someone in an online forum recently questioned the wisdom of buying a 6- or 8-megapixel camera right now. His reasoning was that Moore's law would rapidly make them obsolete by bringing us 12- and 16-megapixel cameras for roughly the same price in 18 months or so. After all, isn't that the effect of Moore's law: The transistor density of chips doubles every 18 months?

Alas, there are two problems with his reasoning. First, Moore's law doesn't really work as advertised, even with microprocessors. However, that's a subject for a future column. More to the point: Moore's law isn't necessarily helping image sensors, because they don't always get better as they shrink in size and increase in density. In fact, they're starting to get worse.

Compare the latest 6-megapixel digital SLRs from Canon and Nikon with the latest 8-megapixel digicams from the same two companies and from Konica Minolta, Olympus, and Sony. If pixels were all that mattered, the digicams would be clearly superior to the DSLRs—but they aren't. The DSLRs produce better images, especially at higher sensitivity (ISO) settings, despite having sensors with 25 percent fewer pixels. Mainly, the DSLR pictures are better because they're less "noisy," also referred to as grainy. They're less noisy because DSLRs have larger image sensors with much bigger sensor sites or "light wells," so they capture more photons per pixel than the digicams do.

Taking advantage of Moore's law to shrink an image-sensor chip and increase the density of its sensor sites has become a disadvantage. A smaller, denser imaging chip has more pixels but is less sensitive and noisier. The key to making better digital cameras is to fabricate larger sensor chips that have room for more of the bigger sensor sites. DSLRs with full-frame (35mm-size) sensors, like the 11-megapixel Canon EOS-1Ds, yield pictures that rival those from medium-format film cameras. Unfortunately, making larger chips runs counter to the goal of Moore's law, which is to make smaller and denser chips.

Nevertheless, Moore's law helps digital cameras in other ways. Sometimes it's possible to reduce manufacturing costs by making image sensors using older, amortized chip-fabrication technology instead of the latest, most expensive technology. Also, other chips in digital cameras definitely benefit from Moore's law—particularly the microprocessors that manipulate and compress each picture before saving it on the memory card. But the heart of a digital camera, its image sensor, defies the famous law.

Tom Halfhill was formerly a senior editor for Byte *magazine and now an analyst for* Microprocessor Report.

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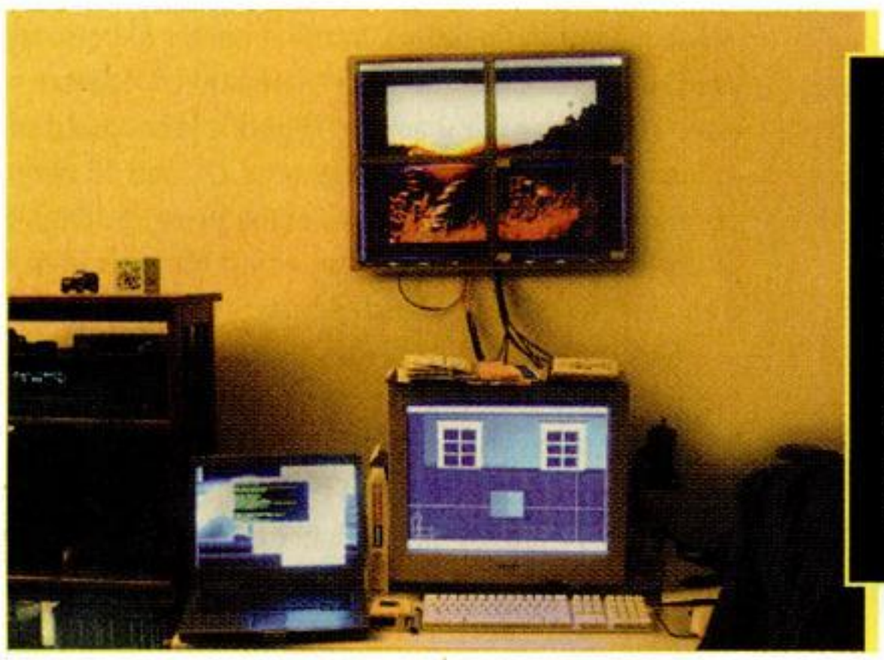
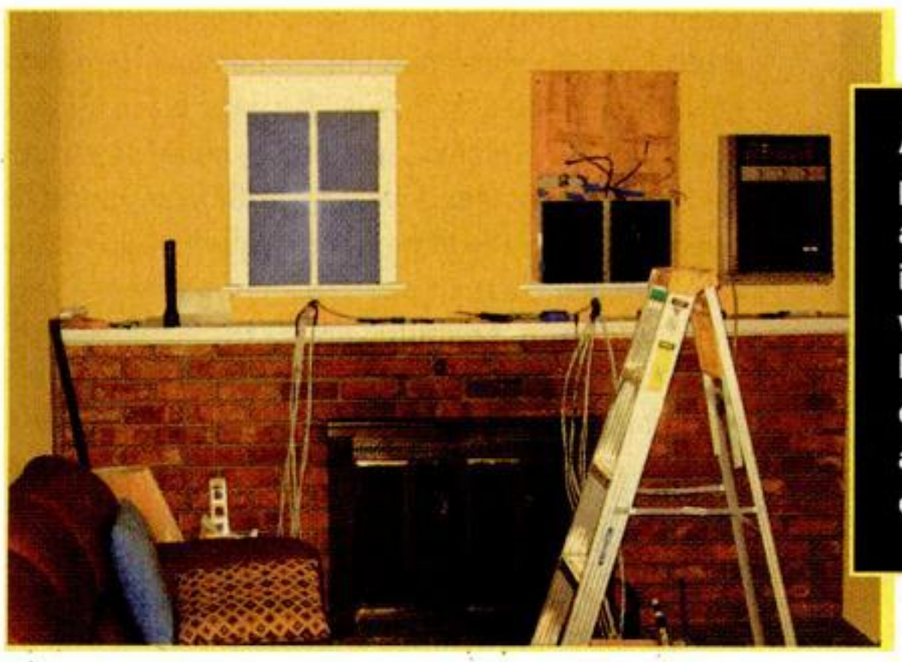
The Virtual Window Project

"Where do you want to live today?"

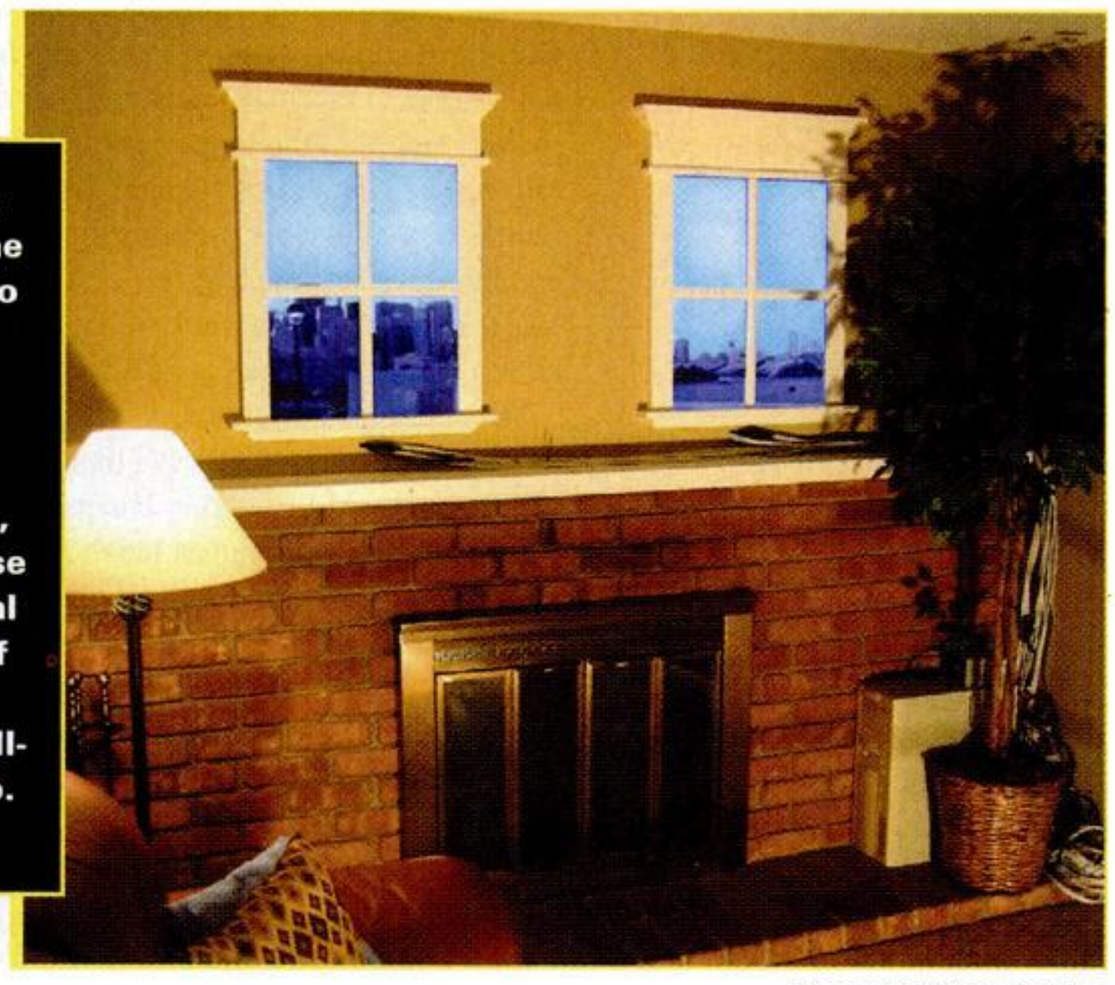
Have you ever wished you could look out your bedroom window and see the gentle waves of a languid Hawaiian beach instead of human bodies floating face down in the East River? If so, check out the Virtual Window Project at **www.hoagy.org/virtualwindow.** Here Ryan Hoagland has turned a stack of discarded LCD panels into a pair of windows that look out onto literally anywhere in the world. Now that's what we call "landscape mode."



Using Visual Basic to cycle the pre-cut images, and Windows to manage the arrangement of the displays, Hoagland developed his first proof-of-concept virtual window.



Although the panels protrude about one-half inch from the wall, Hoagland's handmade frames disguise the edges, as well as the cable runs.



Kicking back in front of the San Francisco skyline, Hoagland begins plans for Virtual Windows 2.0, which will use the additional bandwidth of PCI Express to display full-motion video. Attaboy!

Photograph © Andy Rothfusz

FUN-SIZE NEWS

INTEL SCRAPS 4GHZ PRESCOTT PLANS

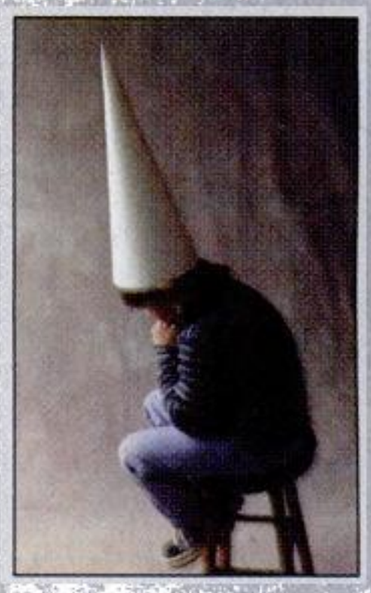
Intel says it has scrapped plans to introduce a 4GHz Pentium 4 using the Prescott core that had been scheduled to ship early next year. The chip-making giant decided to pull the pin on 4GHz in order to shift resources to its dual-core processors which are due sometime in 2005. The company says it still has plans to introduce a P4 Prescott next year with a super-sized 2MB of cache across its entire desktop lineup before dual-core hits the market.

PHONES, HARD DRIVES GET MARRIAGE LICENSE

If you've always wanted to defrag your smart phone, you might get your chance in mid-2005 thanks to the creation of a common interface specification for teeny, weeny hard drives. It's called CE-ATA, and it will govern an all-new generation of drives designed specifically for use in portable devices such as PDAs, handheld video players, palmtops, and smart phones. This new storage specification marks a radical shift away from flash memory, which is both expensive and less capacious compared with conventional magnetic storage drives. The specification should be finalized by mid-2005, with products trickling out shortly thereafter.

SONY'S EPIPHANY: PEOPLE LIKE MP3s!

No doubt tipped off by an industry insider, Sony has discovered an audio compression format called MP3. Acting quickly and decisively, the company announced it will immediately begin integrating support for the format into its flash-based digital audio players (which already support Sony's proprietary ATRAC3 format). This just in: Sony plans to add MP3 support to its hard drive-based digital audio players too!



INFINIUM DELAYS CONSOLE: INSERT "PHANTOM" JOKE HERE

Infinium Labs confirmed that the company's Phantom PC-based game console and the Phantom Gaming Service will not launch in time for the 2004 holiday season. Instead, the launch has been pushed to an unspecified date in 2005. This comes on the heels of a press release announcing a partnership with publishers and developers including Vivendi Universal, Eidos, and Atari, who will be providing content for the on-demand, broadband Phantom Gaming Service—whenever it arrives.

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GAME THEORY

BY THOMAS L. McDONALD

Gaming Auteur? I Don't Think So

Games have had an uneasy time adapting to the "auteur" theory of film, a dubious but widely held belief that a director is the single guiding visionary, or "author," of a film. The notion that a collaborative work which calls upon the unique contributions of many different departments and people, each adding their singular vision, can legitimately be credited to a single creative force is tenuous. There are few directors (Stanley Kubrick was one) who leave their unique mark on every aspect of their work.

The same applies to gaming, where few designers have risen to the level of marquee names. The name-in-the-title club membership is small: Sid Meier, Roberta Williams, Trevor Chan … and American McGee. The list of designers who didn't make the cut is pretty surprising: Peter Molyneux, Richard Garriott, John Carmack, Warren Spector; well, you get the idea. In most cases, the use of a marquee name tells us something. Certainly a game called *Sid Meier's Pirates!* says much more about what to expect than a game named merely *Pirates!* Because Meier designs in code, writing large chunks of the game himself, each project is uniquely his. He is, clearly, a Kubrick figure in gaming.

But what exactly does *American McGee Presents Scrapland* tell us, other than a guy with a pretty cool-sounding name is somehow involved? I don't know American McGee, but from all accounts he's a nice guy. I'm not here to kick him around. But his leap from id Software level designer to marquee name with his first solo outing (*American McGee's Alice*) had everything to do with the sound of his name and nothing to do with his talent.

This may all sound perfectly trivial, but there's something else at work here. Much of *Scrapland* was done by Spanish developer Mercury Steam, with McGee coming into the project late in the game. The same day *Scrapland* landed on my desk, I also got Relic's *Warhammer 40,000: Dawn of War*, which has the unique handprint of designer Alex Garden all over it. (For the review, turn to page 107.) Since *Homeworld*, Garden's strategy games have blended rich tactical elements with remarkably manageable and effective interfaces. He's one of the best designers in the business, but his name is known to few and unlikely to wind up in a title any time soon.

Most games are made by too many diverse hands to lay claim to any sort of auteur status. Games are a synthesis of many visions—art, music, sound, writing, programming, design, even testing—and few people have enough mastery of all these aspects to lay authorial claim to a game.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Wireless USB Gears up for Launch

And when it does, will Bluetooth be pulled?

Plugging a USB device into the dusty rump of a PC ranks second only to cesarean childbirth in national polls of "least fun activities." Luckily, help is on the way in the form of a new wireless specification for USB devices. This emerging specification—cleverly named Wireless USB (WUSB)—will let you create what is basically a wireless USB network that extends 30 feet from your PC, allowing any wireless USB device within range to connect just like a laptop in a hotspot.

According to published white papers, wireless USB will work in a similar fashion to Wi-Fi networks, with a USB host device sending packets of data via a radio signal to wireless clients. Though explicit details of the specification have not been nailed down, the group promoting the specification has settled on a target bandwidth of 480Mbps, the full bandwidth of today's USB 2.0 and 480 times that of Bluetooth. An arrival date for this technology has not been announced, so it's safe to assume it'll arrive "when it's done," which can't possibly be too soon.

Our bet: By this time next year, WUSB will be putting the squeeze on Bluetooth.

JazzMutant's LEMUR

A futuristic "multitouch" panel that plays and displays

Not only does the LEMUR display allow you to interact with up to 10 objects at once (who's got 11 fingers, anyway?), but you can also adjust the "physical rules" that govern each object; a scroll wheel, for example, can be set to "spring back" upon release, or remain at the position it's at when you lift your finger.

Because the standard keyboard-and-mouse combo doesn't cut it for improvisation or live performances, electronic musicians and DJs rely on external hardware controllers that let them spin knobs, push sliders, and hammer buttons to shape their sounds in real time. Of course, hardware controllers have fixed layouts, and if you wish you'd bought one with three modulation wheels instead of two, or six sliders instead of four, you're out of luck. There's no such threat o' regret with JazzMutant's LEMUR, however. It's an endlessly configurable touch-sensitive display surface that lets you drag and drop any combination of "control objects" such as faders, switches, and knobs into any pattern that strikes your fancy. And unlike traditional touch-screen displays, the "multitouch" LEMUR allows you to interact with up to 10 of these objects at once!

JazzMutant expects to begin shipping the LEMUR MultiTouch Control Surface early this year (no suggested retail price has been set as of press time; check **www.jazzmutant.com**). While it's initially being developed specifically for audio applications, we're already wondering how we can hack this bad boy to manage our inventory of weapons in *Half-Life 2*.

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TechnoFile

Quick takes on technology trends

Sony VAIO Type X

Attention Stage Four geeks: The harsh truth is that no matter how hardcore you are, there's someone in Japan who's more hardcore than you. And today, that guy is taking the day off for the white-glove delivery of his VGX-X90P from Sony. The latest in the VAIO "type X" series crams up to 1.3 *terabytes* of storage across four internal hard drives in a badass, monolithic design sure to make every other geek on the block genuflect before you. Why so much storage? Because the type-X series incorporates an unheard of seven individual television tuners.

With seven TV tuners, you can record seven channels simultaneously, sucking down network programming throughout the week and enjoying a decadent smorgasbord of video-on-demand on the weekend. The type-X series (WinXP is the OS, but the rig does not use the Media Center variant) is intended for Japan only, which lacks a popular Tivo-like service. The matching HD tuner and 23-inch HDTV are priced separately. Regardless, we wouldn't mind seeing something this slick show up on our shores. At which point, of course, some Japanese guy will be receiving his 12-zetabyte model with 140 HD tuners. *Damn.*

$4,800, VGX-X90P (main unit only), www.jp.sonystyle.com.

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THE LORD OF THE RINGS
THE BATTLE FOR MIDDLE-EARTH™

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Head2Head

A showdown among CPUs

THIS MONTH: Hot Rod CPUs, Part Deux!

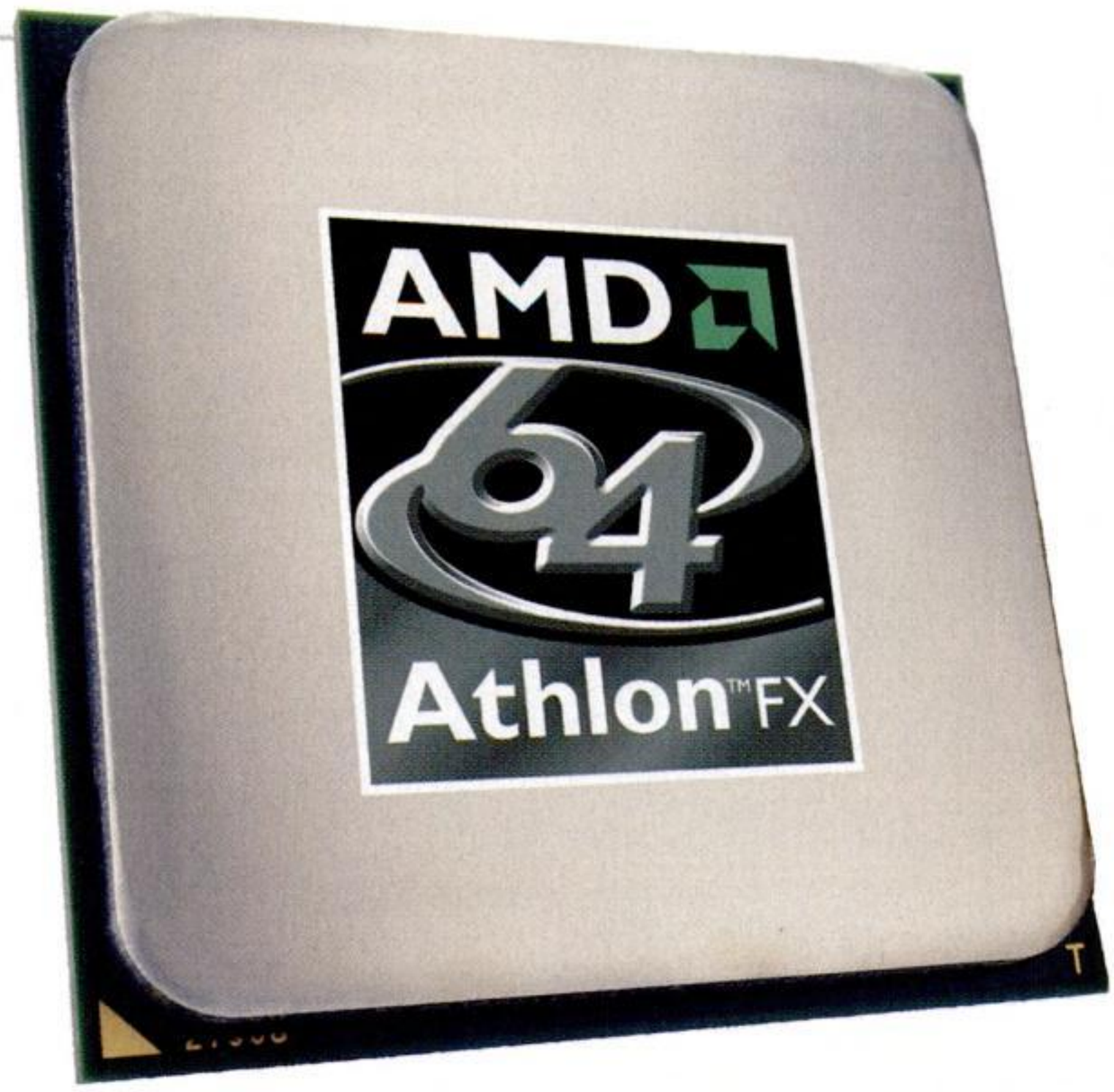
Much has changed in the six months since we last put AMD's and Intel's fastest CPUs in the ring. With the Athlon 64 FX-55, AMD has finally shed its dependency on power-sapping registered RAM, and has added 200MHz to make the CPU a heavyweight contender. Intel has also put its Pentium 4 Extreme Edition through a workout by moving from Socket 478 to LGA775, and by giving it DDR2 and PCI Express capabilities. The biggest improvement, however, is the move to a new 1066MHz frontside bus.

In a huge stunner, our judges deadlocked in May 2004's match between the Athlon 64 FX-53 and the P4 Extreme, as both CPUs landed an equal number of head and body blows. With competition between the two companies intensifying, both chipmakers are anxious for a win in this month's rematch.

It's time to lace up the gloves and find out which CPU will take home *Maximum PC's* championship CPU belt!

—GORDON MAH UNG

ATHLON 64 FX-55



Infrastructure: Finding motherboards for the original Socket 940 Athlon 64 FX CPUs used to be like looking for a clean gas station bathroom in Detroit. The release of Socket 939 fixes this problem. Although the selection is still ramping up, it's nothing to complain about. **Winner: Tie**

Durability: We've sworn like sailors after bending pins on Athlon 64 CPUs (those Socket 939, Socket 940, and Socket 754s all look the same), but it's not so hard to bend them back. You can't say the same for Intel's LGA775, which scares the bejesus out of us every time we install one. **Winner: Athlon 64 FX-55**

Forward compatibility: Is 64-bit computing the future? We're not sure, but we do know this: Right now, the only choice in town is the Athlon 64 series. When you factor in the built-in support for Microsoft's allegedly more secure NX ("no execute") features, which protect your PC from executing viral code, the Athlon 64 makes a damned compelling pitch. With PCI Express boards on the horizon, we're putting this win in AMD's column. **Winner: Athlon 64 FX-55**

Flexibility: If your space capsule just returned from a trip to the future where the planet is run by apes, here's a news flash, Charleton: The Athlon 64 FX-55's integrated memory controller makes it incapable of running DDR2 memory. So toss out those notions about upgrading the way you did with your Athlon XP or Pentium 4. To move to DDR2 next year, you'll have to chuck your CPU and motherboard. **Winner: Pentium 4 Extreme Edition**

Price: At $827 a pop when purchased in bulk, the Athlon 64 FX-55 isn't exactly a bargain, but it is the fastest game in town and costs about $150 less than the P4EE. Still, we fondly recall the days when the fastest CPU set us back only $500. **Winner: No one**

Performance: When we last met, I was but the learner. Now I am the master! Actually, that's a slight exaggeration. When our Lab compared the FX-53 with the P4EE, we called it a draw because each CPU won benchmark tests that catered to its particular strengths. We can't say that now. The Athlon 64 FX-55 cut through our benchmark suite like a light saber through an Ewok. The contest was such a one-sided ass-kicking that we triple-checked our results. They were spot on; the Athlon 64 FX-55 dominates. (See page 24 for a full report on performance). **Winner: Athlon 64 FX-55**

THE SPECS	2.6GHz Athlon 64 FX-55
Front side bus	N/A (integrated into core and runs at core speed)
Interface	Socket 939
L1 cache	64KB instructions / 64KB data
L2 cache	1MB
Process technology	130nm
Price	$827 (@1,000 units)

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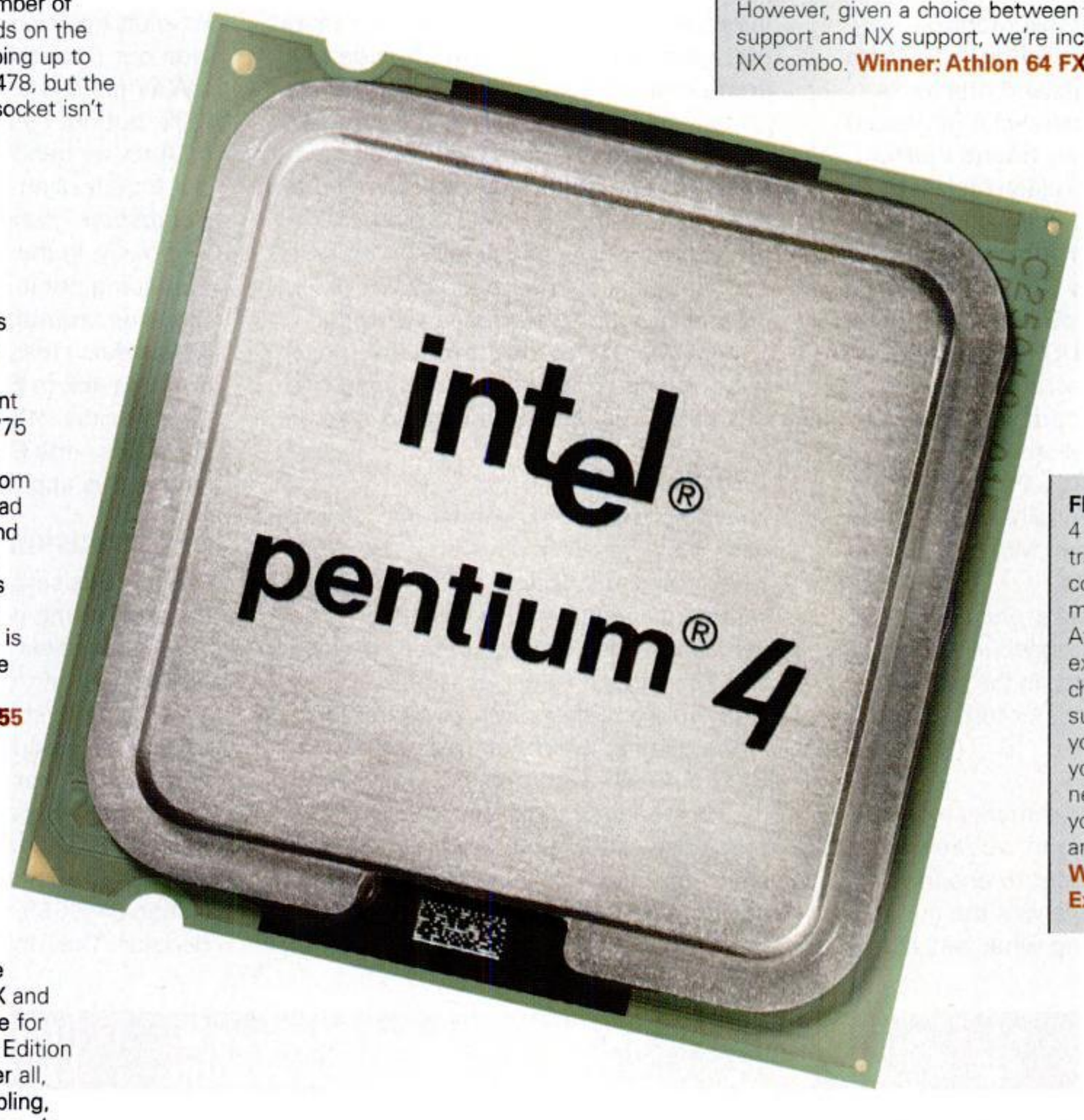
INTEL 3.46GHZ PENTIUM 4 EXTREME EDITION

Infrastructure: You could fill a dump truck with the number of Socket 478 motherboards on the market. LGA775 is ramping up to fill the shoes of Socket 478, but the availability for this new socket isn't there yet. **Winner: Tie**

Durability: After months of service, Intel officials tell us they've received only a few reports of bent pins with the new LGA775 interface. Unfortunately, months of complaints from motherboard vendors, bad press on the Internet, and a few anecdotal stories we've heard from OEMs have us as scared as an Orange Alert. The reality is that installation is a more delicate process here. **Winner: Athlon 64 FX-55**



Performance: Since the introduction of the 925X and 925XE chipsets, our love for the Pentium 4 Extreme Edition has waned. We did, after all, drop the P4EE for its sibling, the P4 Prescott, in this year's Dream Machine. With its newly inflated 1066MHz frontside bus, we thought the sparks might be rekindled, but alas, we can't shake the sensation that this love affair is over. Over! For the details of our breakup, see page 24. **Winner: Athlon 64 FX-55**

Price: We really want to meet the guy or gal who buys the P4EE because it's $999 but not $1,000. Just call it $1,000, for crying out loud. In the end, the prices of both the P4EE and Athlon 64 FX-55 make them painful, bank account-emptying purchases. **Winner: No one**

Forward compatibility: Right now, you have to make a trade-off in the upper echelons of computing. If you want DDR2, the only game in town has an Intel badge on it. However, given a choice between DDR2 and both 64-bit support and NX support, we're inclined to pick the 64-bit/NX combo. **Winner: Athlon 64 FX-55**

Flexibility: The Pentium 4 Extreme Edition's traditional design continues to make it far more flexible than the Athlon 64 series. If, for example, Intel releases a chipset with DDR2/800 support in 2005 and you want to upgrade, all you have to do is buy a new mobo and drop in your EE. It doesn't get any easier than that. **Winner: Pentium 4 Extreme Edition**

THE SPECS	3.46GHz Pentium 4 Extreme Edition
Frontside bus	1066MHz
Interface	LGA775
L1 cache	8KB data / 8KB trace cache
L2 cache	512KB
L3 cache	2MB
Process technology	130nm
Price	$999 (@1,000 units)

THE UPSHOT

Unshackled from registered RAM and packing 200MHz more than the FX-53, the Athlon 64 FX-55 simply wailed on the Pentium 4 Extreme Edition in our tests and earns our championship belt with a near-unanimous decision. With PCI Express boards about to become available for this platform in the near future, there's only once choice if you want the fastest CPU in town: **Athlon 64 FX-55**.

Continued on next page ➡

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Why the Athlon 64 FX-55 Is King of CPUs

Read on to find out exclusive information on how we tested these new CPUs, and what the results mean for your next CPU upgrade

During testing for this month's Head2Head, we used as many common components and drivers as possible, including a parallel ATA Western Digital WD2500JB drive, Sound Blaster Audigy 2 ZS card, and clean installations of Windows XP Pro with Service Pack 1.

Because the 3.46GHz Pentium 4EE was tested with Intel's new 925XE chipset, we could only use PCI Express and DDR2 RAM for the P4. PCI-E and DDR2 are not available for the FX (not yet, at least), so we had to use an AGP/DDR board. For graphics, we used an nVidia GeForce 6800 Ultra in AGP for the FX-55, and a PCI-E version for the P4EE, and we manually set the clock speeds for each. Corsair Micro RAM was used in both platforms.

For comparison's sake, once our tests were done, we also dropped in a 3.4GHz Pentium 4 EE operating on the 800MHz frontside bus and reran our tests.

The Benchmarks

We chose gaming benchmarks to stress the CPU and chipset, and we ran them at a low resolution in order to ensure that the CPU's performance was the limiting factor. Perhaps sensing what was coming, Intel has been evangelizing the argument that game-based tests using timedemos aren't realistic. Timedemos don't run physics or AI algorithms that would stress a CPU, Intel argues, and therefore are just a test of how fast a CPU can shove vertex data down the AGP or PCI-E pipe. Point taken—that's why we also test with real-world applications such as *Photoshop*, *Premiere*, and *Mathematica*, as well as *SYSmark2004*. We also tested the CPUs' multitasking capabilities by running two CPU-intensive tasks at the same time.

The Results

The FX is such a clear winner that it takes us back to the good old days, a simpler time when you could declare a CPU the winner without having to qualify it like those pharmaceutical ads that warn of headaches, nausea, and—yikes!—anal leakage.

Simply put, there was no contest in any of the gaming benchmarks. Even in *SYSmark2004*, where Intel usually leads, the FX managed to tie the P4EE. The shock of the day came in our *Photoshop 7* test, which also tends to favor the P4EE. The FX performed faster in *Photoshop* than even our Dream Machine 2004, which uses a P4 Prescott overclocked to 3.97GHz. The P4EE won our *MusicMatch 9* test, where we take a WAV file and convert it to a high-quality MP3, but not by a large margin.

Another benchmarking shocker came in our multitasking test, where we run our *Photoshop 7* script and *MusicMatch* simultaneously. In the past, the P4's Hyper-Threading put it in front in both tests, but this time around, the FX completed *MusicMatch* first, and then trailed the Pentium 4EE in *Photoshop 7*. The only good news for the P4EE is its *Premiere Pro* performance—the CPU is still the undisputed king in this application.

In Conclusion...

With all this said, it's clear the 1066MHz bus pays satisfying performances dividends when compared with the older 800MHz bus. However, the performance of the P4EE stood in such stark contrast to the A64FX-55 that we wonder if there wasn't an issue with the BIOS or mobo. We'll consider retesting with a different motherboard or new BIOS when they become available.

Overall, this was such a clear win for the Athlon 64 FX-55, that there is no arguing our decision. The Athlon 64 FX is the champ. ■

CPU	Athlon 64 FX-55	Intel Pentium 4 Extreme Edition	Intel Pentium 4 Extreme Edition
CPU clock	2.6GHz	3.46GHz	3.4GHz
Frontside bus	Core speed	1067MHz	800MHz
Chipset	VIA K8T800	Intel 925XE	Intel 925XE
RAM	1GB Corsair DDR400	1GB Corsair DDR2 / 533	1GB Corsair DDR2 / 533
SYSmark 2004 Overall	**202**	201	194
SYSmark 2004 Content Creation	**235**	231	226
SYSmark 2004 Office Productivity	173	**175**	166
Mathematica 5 (seconds)	**467.99**	497.875	610
Quake III Arena 1.32 Four Demo (fps)	**509.7**	477	463
Doom III 1.1 (fps)	**114**	93.3	90.8
3DMark 2001 SE 330 Overall	**26904**	23710	23021
3DMark03 340 Overall	**13137**	12607	12514
3DMark03 340 CPU	**1204**	1035	1003
3DMark05 110 Overall	**4438**	3917	3892
3DMark05 110 CPU	**5203**	4917	4797
UT2003 Demo Fly By (fps)	**353**	286	278
Premiere Pro (seconds)	622	**510**	523
Photoshop 7.1 (seconds)	**243**	268	272
MusicMatch 9 (seconds)	235	**222**	229
Multi-Task Photoshop 7.1 (seconds)	481	**399**	410
Multi-Task MusicMatch (seconds)	**302**	370	373
Sandra RAM (MB/s)	**5770**	5440	4692
SETI (minutes)	**89.9**	104.8	107.0

Best scores are bolded.

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WatchDog

Say hello to Sophie, WatchDog of the Month.

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after...

>Go-L Computers >Himself >Dell

Go-L.com Gone?

From its inception, PC maker Go-L Computers was embroiled in controversy. Now the company known for its flashy web site and unattainable technology may die in controversy as well. After a splashy launch in September 2003, the PC maker appears to be shutting its doors for good.

"We are no longer in a position, from a financial standpoint, to continue doing business, meeting each of the high standards we have continually set for ourselves and for you, and are regrettably forced to suspend our operations and liquidate our assets in support of our financial responsibilities," the company said in a statement on its web site. Go-L's message also said the company had stopped taking orders, but would try to fulfill what orders it had already taken. Go-L pledged to offer some tech support and driver updates through e-mail, but for the most part, the company is likely toast.

What went wrong?

The Dog spoke to Eric Kendell of Go-L who said several unfortunate financial crisis put a crimp on the company's bottom line. Several customers purchased large amounts of equipment and then reversed the charges after receiving the equipment, he said. Kendell said Go-L was forced to eat both the charge-back and the equipment cost because of the way American Express handles such matters.

"We got screwed out of the product and cash," Kendell said.

Go-L also took a hit because business was too good. Kendell said the company recently had its merchant account—the ability to take credit cards—yanked because Go-L was exceeding its limit on customer charges.

Kendell also said problems with suppliers and manufacturing contractors, as well as the business climate in California and the U.S. added to the burden. According to Kendell, in October Go-L laid off most of its 30 person staff. He said the company is holding some hope that an investor will step in to save it, but otherwise Go-L will file for Chapter 13 and liquidate all of its assets.

> *"GO-L WAS NEVER ABLE TO SHAKE ITS REPUTATION FOR OFFERING VAPOR PRODUCTS, AND THE FLAMES WERE FURTHER FANNED BY THE COMPANY'S GOODBYE MESSAGE."*

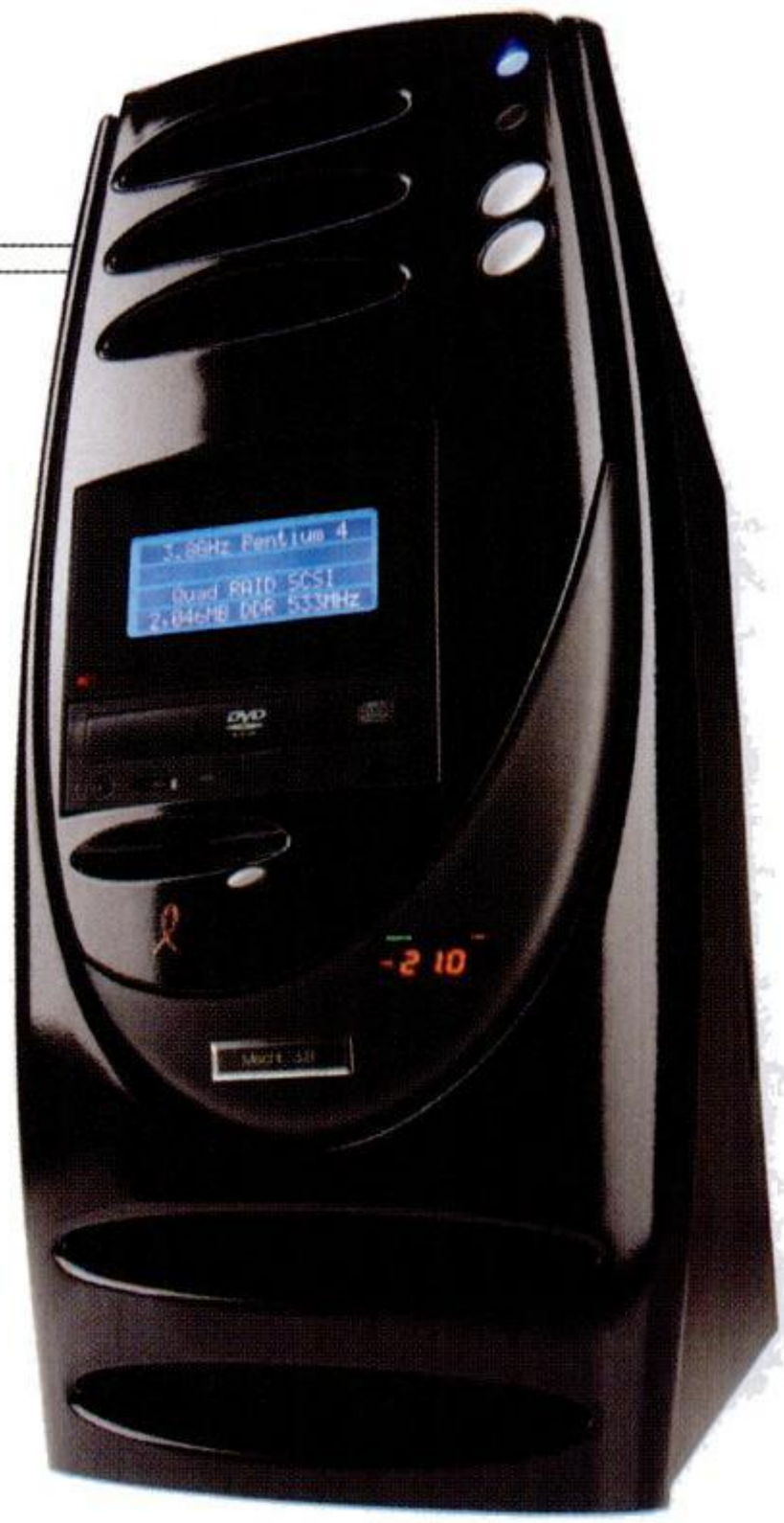
MADE OF UNOBTANIUM

Even after a year and a half of business, Go-L was never able to shake its reputation for offering vapor products, and the flames were further fanned by the company's goodbye message. On its web site, Go-L said it had prototypes of the "world's first dual-processor laptop computer based on the XeonMP and Opteron architectures, the world's first single Processor Personal Super Computer L One running at 5GHz, with specs of cFFT- 64k 0.66 msec/ cFFT - 1024k 13.20 msec/ 1 million point Arctan2 2.63 msec/ 128K rectangular to polar 0.33 msec and capable of 16 gigaflops peak performance, and the world's first 133 MicronUI multiprocessor mainstream business Super Computer capable of over 400 gigaflops peak performance."

If you can't make heads or tails of these claims, you're not alone. What we do know is that XeonMPs are huge, power hungry processors that come with up to 4MB of L3 cache. Because workstation versions of the XeonMP and Opteron usually require power supplies of 500 watts or more and dual heatsinks for the massive amount of heat they generate, it's highly improbable that the procs would serve as the core of a laptop.

Others on the Internet have pointed out that Go-L's much-publicized PuRAM is really nothing more than a Cenatek Rocket Drive, and the trademark on CacheFlow, which Go-L claims to own, belongs to another company. Earlier this year, Go-L raised a lot of fanfare about its intentions to open several retail outlets, but none ever materialized.

Kendell insisted that accusations about the company's legitimacy are preposterous. According to him, the company has prototypes of the outrageous-sounding laptops and has shipped everything promised up to this point. In fact, Kendell said, Go-L has done more than $1 million in business over the last year and a half.



Go-L Computers has shut its doors and laid off most of its staff.

What's the truth? After featuring Go-L on its January 2003 cover, *Maximum PC* solicited testimony from consumers who had purchased Go-L systems. Several months later, the magazine has heard from only one Go-L PC owner. That person claimed to have bought a 3.8 Mach L that could overclock to 4.5GHz without any problems. Others, however, had a very different experience.

"After seeing a picture of a Go-L Computer, I was compelled to find out what it was and how I could get one. Browsing the company's web site, I was like a little kid in a candy store," said reader Chris Walker. "I e-mailed Go-L Computers asking to be put in contact with a salesperson. A couple of weeks later and still no reply. So I sent a second e-mail, saying I was very interested, and wanted to make a purchase, but wanted to talk about hardware details with a salesperson. Still no reply. I sent a third e-mail

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recently telling the company it was full of shit and needed to take down its web site."

Several other readers had similar stories: They were simply unable to buy a Go-L machine or one of its sexy-looking multi-panel displays. So wherein lies the truth? It's probably somewhere in the middle. Go-L Computers did exist. It did sell some computers and monitors, although the specific number will probably never be known. Go-L Computers' marketing, done primarily through its web site, was definitely over the top, and it's fair to say it played fast and loose with technology terminology. But in the end, we'll probably never know the full story behind the illustrious but short-lived company named Go-L.

> ***"I HAVE TO CALL THE WATCHDOG ON THE WATCHDOG, THOUGH, BECAUSE HE MADE A BIG MISTAKE THAT PEOPLE FALL FOR EVERY DAY..."***

Watching the Watchdog

In the October issue, Mike Swanson wrote to the Watchdog about an e-mail he received regarding a PayPal class-action settlement and its legitimacy. The Watchdog responded with a very informative briefing on the lawsuit, and informed PayPal users how to get additional related info. I have to call the Watchdog on the Watchdog, though, because he made a big mistake that people fall for every day and that the Watchdog himself even warns about. The e-mail Swanson received was not legitimate. His e-mail was from paypal@settlement.com, not settlement@paypal.com—the legitimate address.

Hopefully your own mistake will help others see how even the people who investigate this stuff can be fooled from time to time. And hopefully, Mike didn't give away any information he may regret. Woof!

—STEVE ALLMAN

THE WATCHDOG RESPONDS: Good catch, Steve. Your message is one that always bears repeating. Luckily, in this case, the mistake arose from a typo made by Mike Swanson. In his e-mail to the Watchdog, he identified the sender of the PayPal info as paypal@settlement.com, but the e-mail he forwarded to the Dog was in fact from settlement@paypal.com. Nontheless, the Dog should have caught this Freudian slip and corrected it in his column. ■

RECALL ALERT

Dell is recalling more than 4 million faulty power bricks that may go up in smoke.

Dell is recalling some 4.4 million power bricks sold with its notebook computers during a four-year period.

About 990,000 of the adapters were sold in the United States but world-wide figures put the total near 4.4 million. The adapters can overheat and pose a shock and fire hazard. Dell reported seven incidents of the adapters overheating, but no injuries were caused. The adapters were sold with Dell Latitude, Precision, and Inspiron notebook computers between September 1998 and February 2002.

The Consumer Product Safety Commission said the affected notebook models are:

- Latitude CP, CPi, CPiA, CPtC, CPiR, CPxH, CPtV, CS, CSx, CPxJ, CPtS, C500, C510, C600, C610, C800, C810, V700, C-Dock, C-Port.
- Inspiron 2500, 2600, 3700, 3800, 4000, 4100, 4150, 5000, 5000e, 7500, 7550, 8000, 8100, Advanced Port Replicator, Docking Station.
- Precision M40

The power adapters were made by Delta Electronics in China and Thailand and carry the identifiers "Dell" and either P/N 9364U, P/N 7832D, or P/N 4983D on the back of the adapter. If you have one of the adapters, Dell is advising you to immediately stop using it and contact the company for a free replacement. For more information call Dell at 800.418.8590 between 9 a.m. and 6 p.m. central time Monday through Friday, or visit www.delladapterprogram.com.

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

"Without guys like me, you'd still be playing Pong."

—Mark Hartlieb
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BEST VIDEOCARD

Two PCI Express GeForce 6800 Ultras

We'll call this one the Doublemint award. After all, what better way to double your pleasure than with a pair of GeForce 6800 Ultras? The PCI Express bus was the last piece nVidia needed to resurrect SLI-style, multiple-videocard-in-one-system mojo. With a dual-6800 Ultra rig, you can nearly double the performance of any single videocard solution... and run *Doom 3* at 2048x1536.

www.nvidia.com, $1,000 *(requires a special mobo)*

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Maximum PC heralds the most divine hardware of 2004

We'll keep this short and sweet: You are about to experience one of *Maximum PC's* most important stories of the year. See the gold lighting and dramatic camera angles below? You'll find this treatment on every page throughout this story, and it's meant to convey a singular notion: That some PCs and PC components are, in fact, divine.

Over the course of a calendar year, the Maximum PC Lab scrutinizes and tests hundreds of different products in a wide range of categories. Only a select few elevate our rigs to the highest levels of PC-induced transcendence. These are those products. We guarantee they'll make a fine addition to your computer—and your life.

***Maximum PC* proudly presents the finest hardware of 2004.**

GEAR of the YEAR 2004

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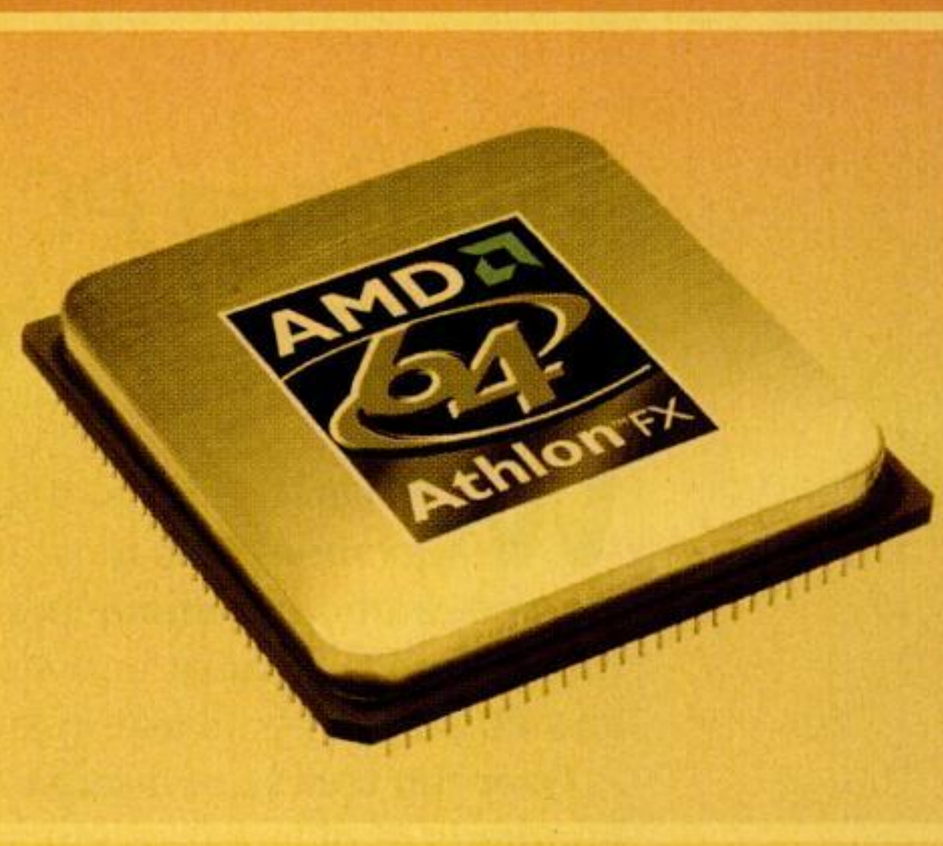
BEST CPU

Athlon 64 FX-55

Last November, we said AMD was betting the proverbial fab on the success of Athlon 64. With more than a year's perspective on AMD's gamble, we'd have to say the company has hit the jackpot. Say what you will, but the performance of the Athlon 64 FX CPU cannot be disputed. Consider: In our Lab two months ago, an Athlon 64 FX machine running at 2.6GHz actually beat a P4 box running at 4.28GHz. That pretty much sums it up.

www.amd.com, $827



BEST MOTHERBOARD

Asus P5AD2 Premium

We secretly call the Asus P5AD2 Premium "the Sink" for short. That's because it jams every mobo feature you'd ever want onto a PCB. We're talking FireWire B, dual Gigabit LAN, onboard Wi-Fi, an external SATA adapter, and no fewer than three—three!—RAID subsystems. Couple this with Intel's new 925X PCI Express chipset (which heralded the brave new world of PCI Express) and you've got what is clearly the best motherboard of 2004.

www.asus.com, $260 (925X chipset: www.intel.com)

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Western Digital 740GD Raptor

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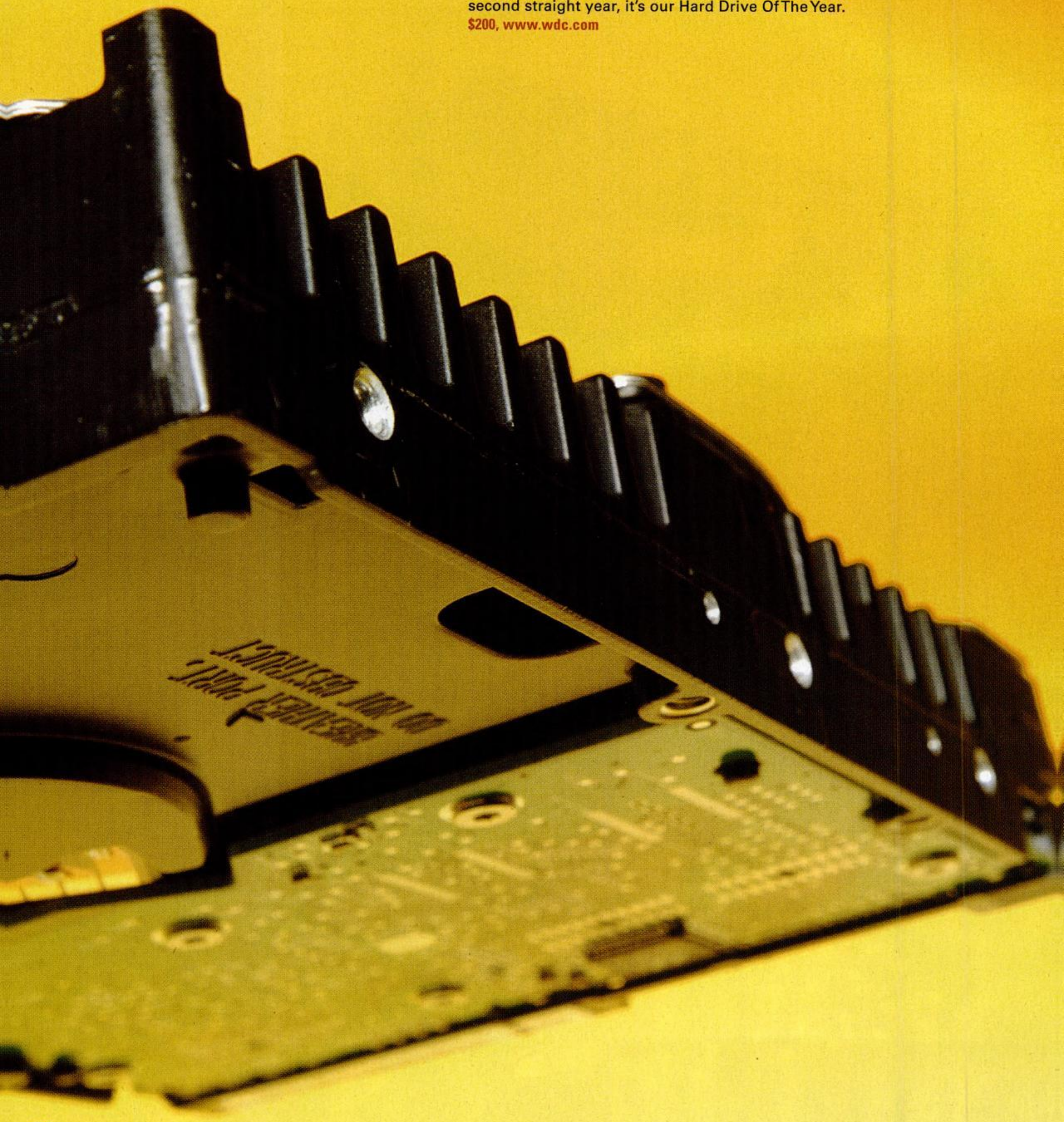

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BEST DISPLAY

Hewlett-Packard f2304

Boy, have times changed. Last year, honors went to Sony's F520 CRT monitor (which had swept *every* competition for several years running). Today that monitor is no longer available... *and we don't even miss it.* At long last, LCD displays have won our affections, and this one has us particularly smitten. It's sharp, it's bright, and colors are vivid, but the clincher is its 23-inch widescreen profile—it has us gazing upon all it displays with a new sense of wonder. Who knew HP could bring it like this? *See page 98 for a detailed review.* $2,100, www.hp.com

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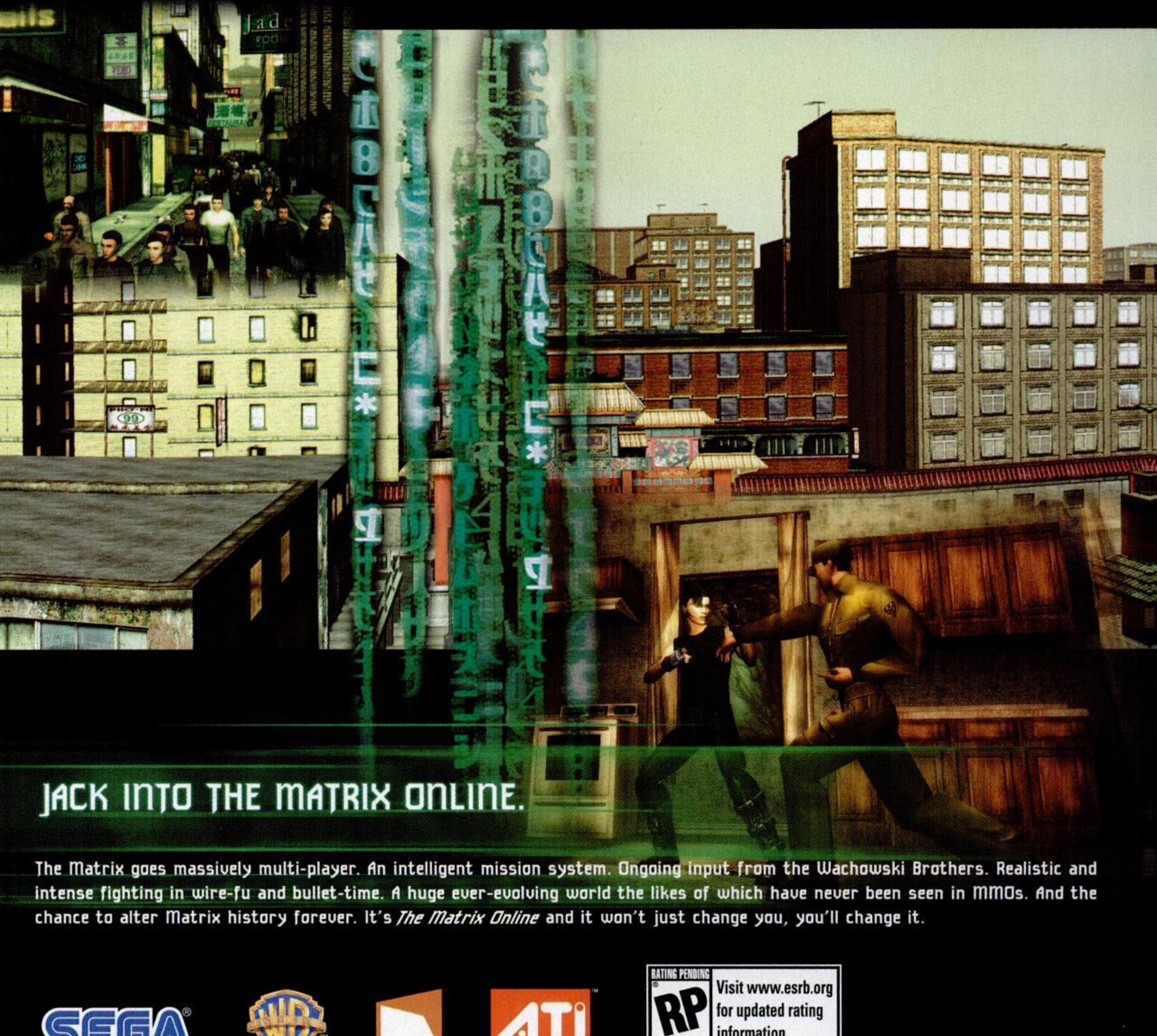
All I can do is show you the door.

You're the one that has to step through.



JACK INTO THE MATRIX ONLINE.

The Matrix goes massively multi-player. An intelligent mission system. Ongoing input from the Wachowski Brothers. Realistic and intense fighting in wire-fu and bullet-time. A huge ever-evolving world the likes of which have never been seen in MMOs. And the chance to alter Matrix history forever. It's *The Matrix Online* and it won't just change you, you'll change it.

RATING PENDING
RP
CONTENT RATED BY ESRB
Visit www.esrb.org for updated rating information.

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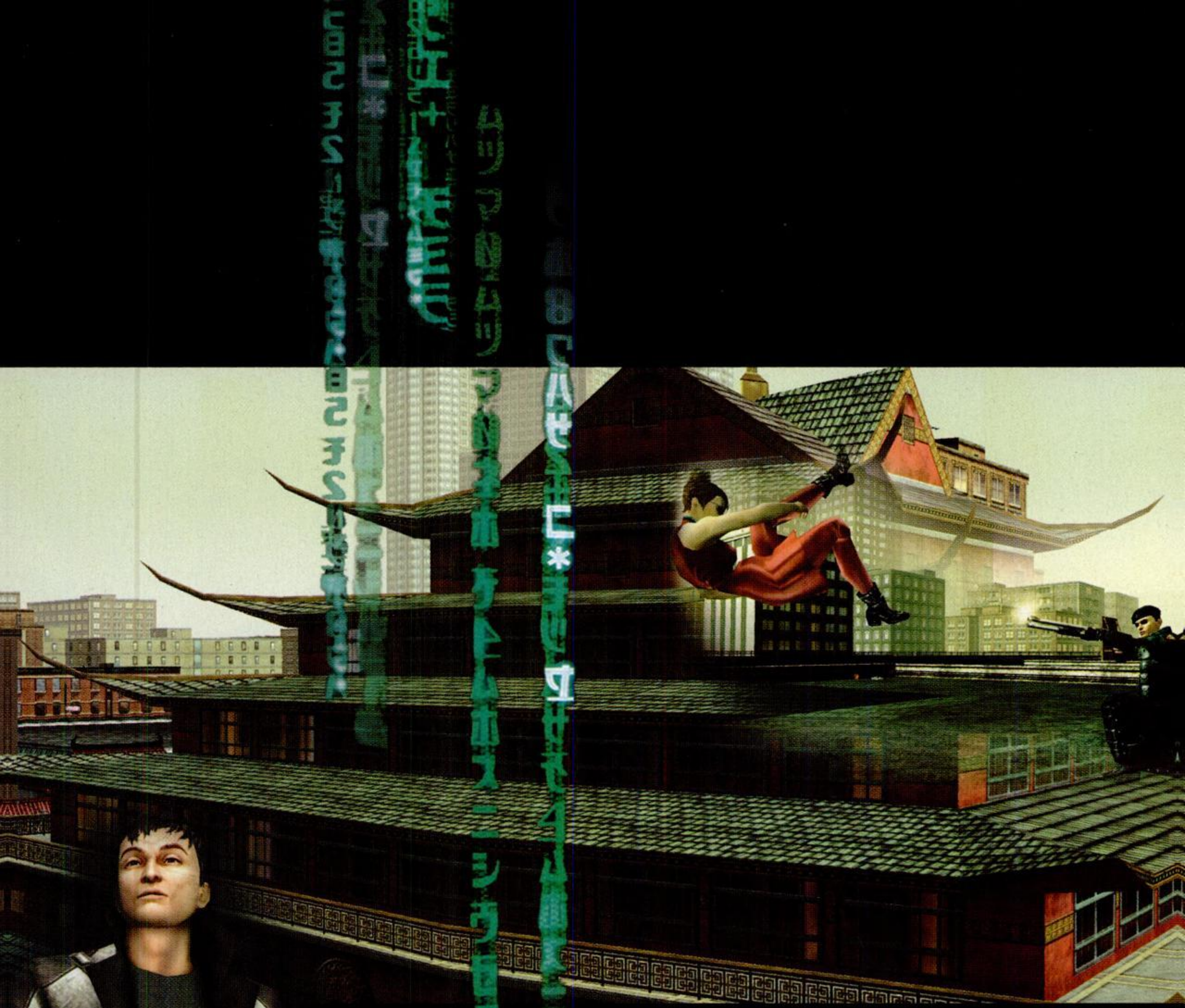

THE
MATRIX
ONLINE

To pre-order, jack into www.thematrixonline.com

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BEST NOTEBOOK

Dell XPS

Dell's brutish XPS notebook has done what the company's desktop brethren can't: kick-ass and take names. This laptop even knocked out more than a few PCs built by the top boutique shops. The latest rev of the XPS, with an ATI Mobility Radeon 9800 card and 3.4GHz Pentium 4 Extreme Edition CPU, is such a monster it quickly reduces other "gaming" notebooks to chump status. To give you one final idea of how fast the XPS is, consider this: It's faster than a lot of desktop computers we review. **www.dell.com, $4,300**

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BEST OPTICAL DRIVE

Sony DRU-710A

Sony has the distinction of delivering to *Maximum PC* the first drive capable of burning 8.5GB of data to double-layer discs using the new DVD+R DL format. This distinction has doubled as the company pulls ahead at the end of the year with the DRU-710A, capable of burning double-layer discs at 2.4x and single-layer discs at a scorching 16x. That's more than 20MB a second, or the equivalent of a 144x CD burner! And unlike the competing format that boasts a 4x double-layer burn speed—can you say *–R*?—DVD+R DL is enjoying strong support, meaning you can actually buy the media you need for this kind of speed. **www.sony.com, $180**

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GEAR of the YEAR

BEST OF THE REST

Round out the perfect PC with these other Gear Of The Year winners.

BEST BACKUP DRIVE

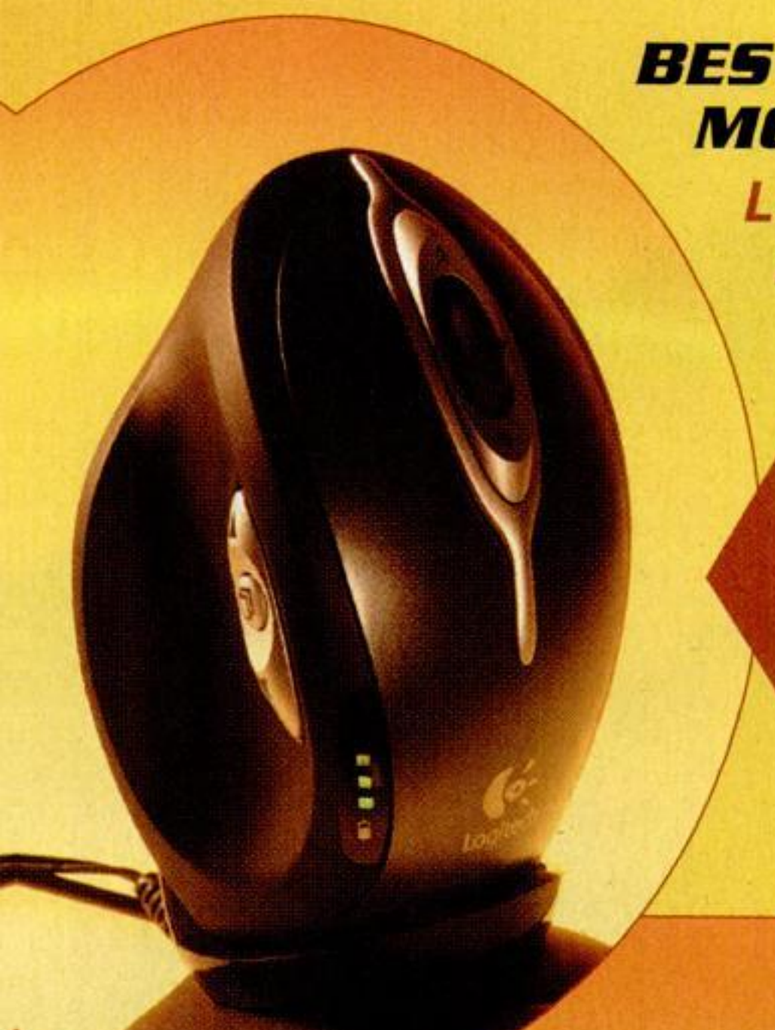
Western Digital Dual-Option Media Center

There are plenty of 250GB, 7,200rpm external drives on the market, but only WD's Media Center sports a built-in 8-in-1 media reader and USB ports.
www.wdc.com, $280

BEST CASE ENCLOSURE

Silverstone TJ03 Nimiz

When people talk about the "decadent West," they're referring to the likes of the TJ03 computer case. It's so luxurious and packed with features as to be obscene, and it's easy on the eyes to boot.
www.silverstonetek.com, $270



BEST MOUSE

Logitech MX1000

Not only is it powered by frickin' lasers, this cordless mouse possesses perfectly fluid motion, and has the best battery life we've ever seen. It's all a mouse should be.
www.logitech.com, $80

BEST WI-FI DEVICE

Squeezebox

This beautiful Wi-Fi powered music streaming box delivers audiophile-quality sound to multiple rooms in your home. It's easy to use, and extremely reliable. **www.slimdevices.com, $280**

BEST PORTABLE STORAGE

LaCie 100GB Mobile Hard Drive

The LaCie Mobile drive delivers a double-tap to the competition by offering both the highest capacity *and* the smallest formfactor of any USB or FireWire drive we've tested. It's even bus-powered and, dare we say, scrumptious?
www.lacie.com, $370

BEST SPEAKERS

Logitech Z-5500 Digital

The Z-5500 Digital delivers a devastating combination of velvet glove elegance and brass knuckles power that is intoxicating to experience. This truly is the best speaker system—by any measure—our Lab has ever tested.
www.logitech.com, $400

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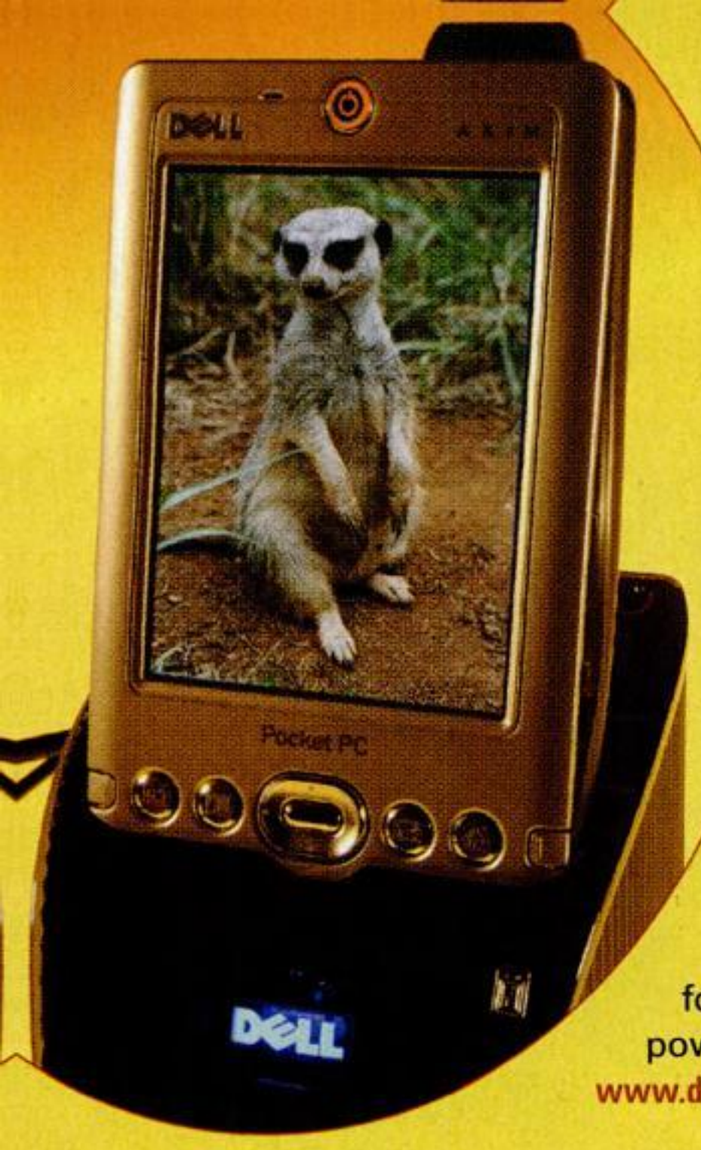
BEST OF THE REST

GEAR of the YEAR



BEST PDA

Dell Axim X30

Dell's Axim X30 shames even the new higher-resolution PDAs with its ultra-wee formfactor, sleek design, and stunning Wi-Fi range. And with a 624MHz proc, Dell doesn't force you to compromise on power.

www.dell.com, $350

BEST SOUNDCARD

Creative Labs Sound Blaster Audigy 2 ZS

Even Yoda cannot see the future for accelerated soundcards, but today, the Sound Blaster Audigy 2 ZS series stands alone as the only DSP-equipped card with EAX 4 support. Get one while the category still exists.

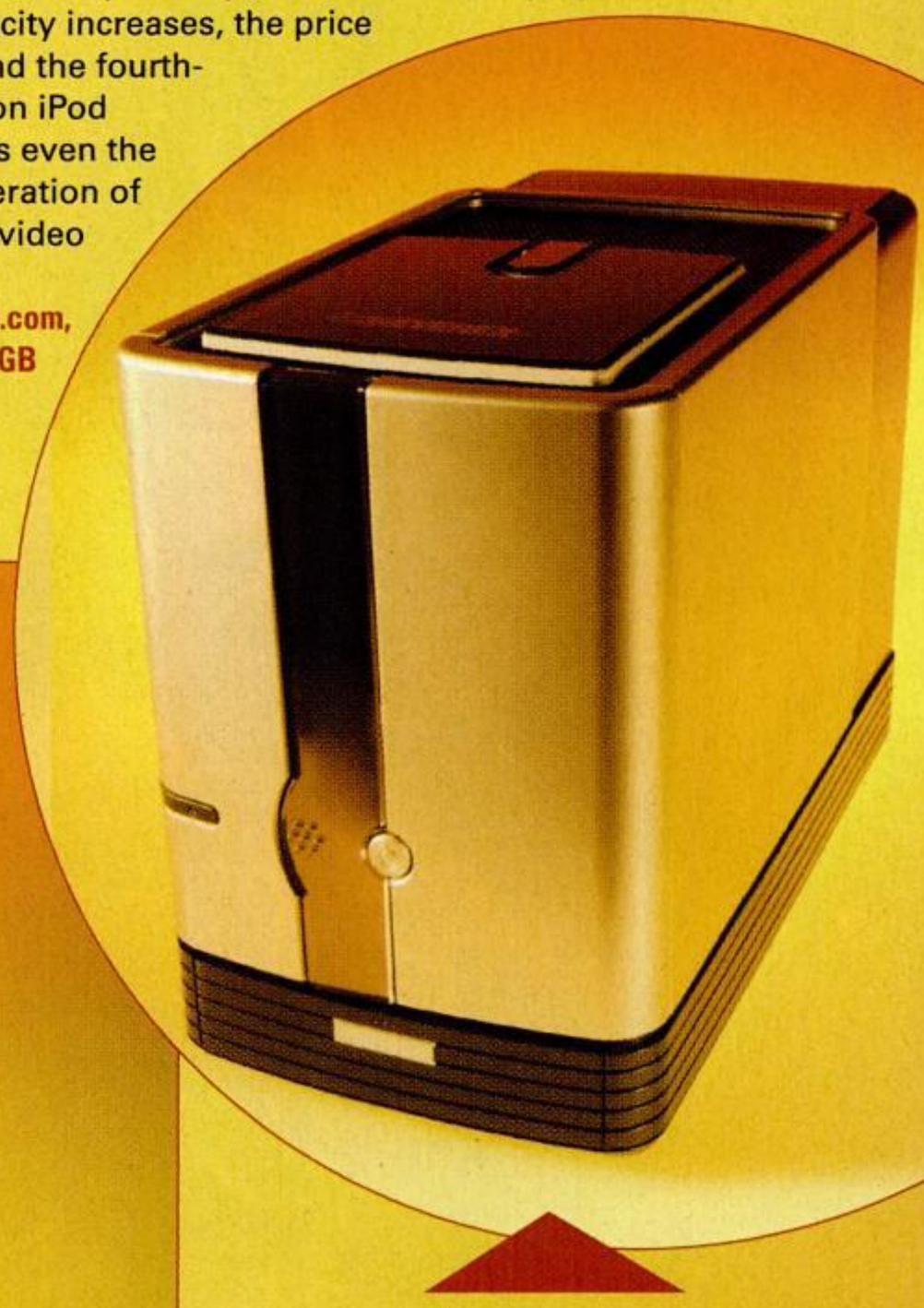
www.soundblaster.com, $100-$200

BEST MEDIA PLAYER

iPod 4G

Apple's winning streak endures as the company continues to improve upon its iconic MP3 player. The capacity increases, the price drops, and the fourth-generation iPod outshines even the first generation of portable video players.

www.ipod.com, $400 for 40GB

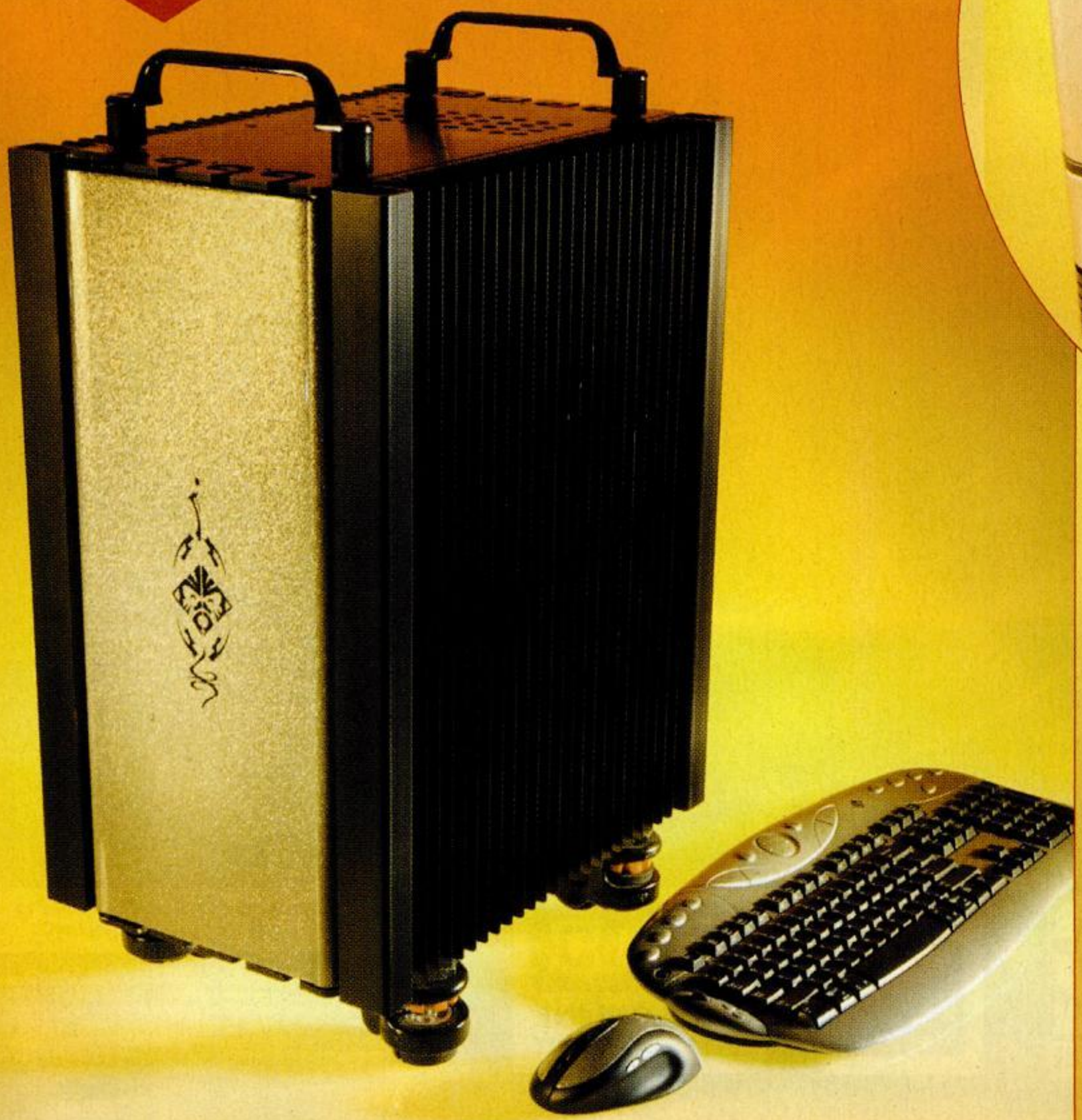


MOST BREATHTAKING PC

Voodoo Rage F-50

When the Rage F-50 first entered the Maximum PC Lab, we were stunned. Only the maniacs at Voodoo would have the raw temerity to build a PC with no active cooling. Look at those sexy cooling fins!

www.voodoopc.com, $3,890



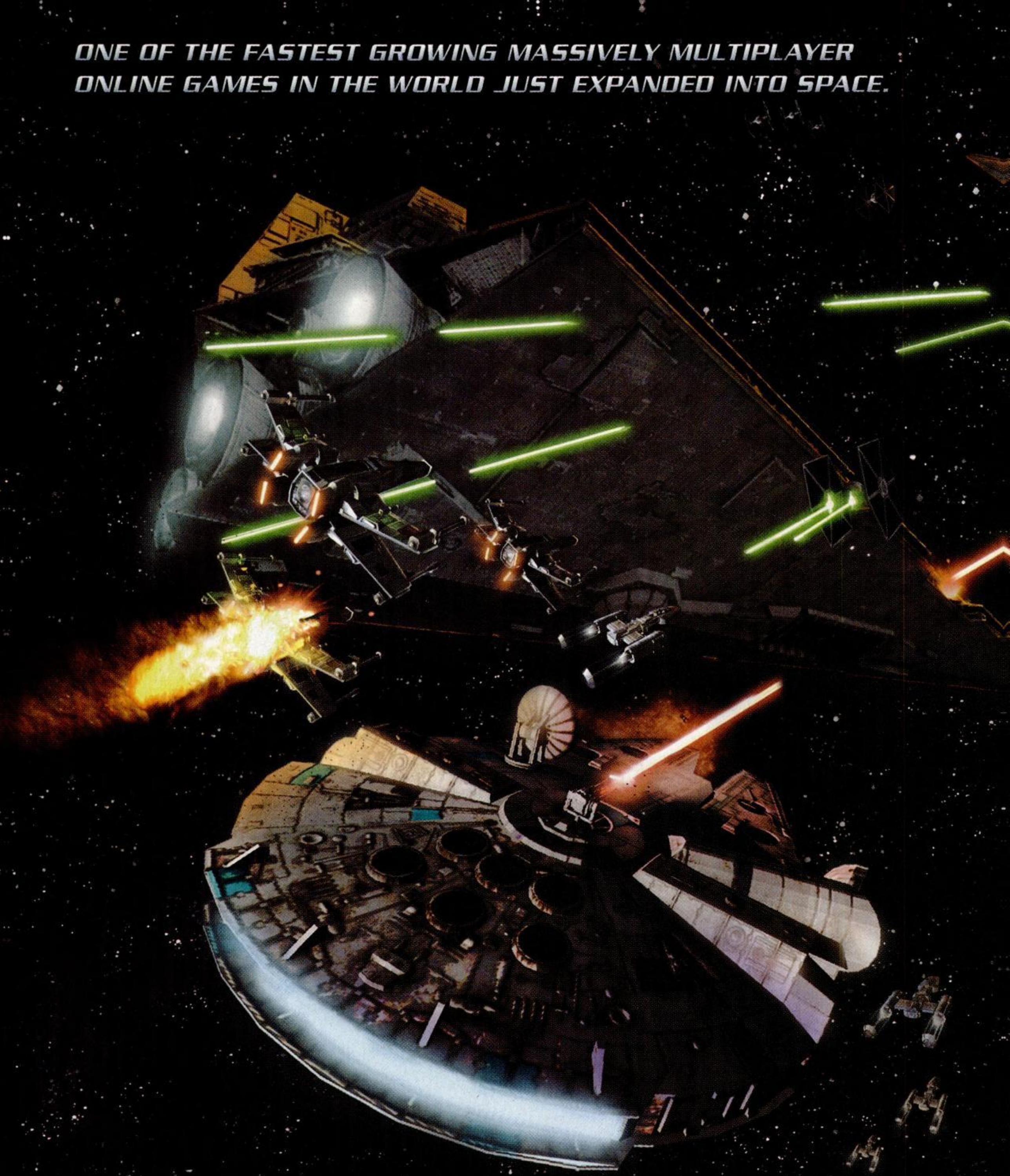
BEST SMALL FORMFACTOR

FIC Condor

FIC's revolutionary Condor may have stolen its design from Apple's playbook, but no other SFF gives you such easy access to its innards. The Condor practically eliminates the dread you get with other SFF's when you have to change the RAM or CPU.

www.fica.com, $250 ■

ONE OF THE FASTEST GROWING MASSIVELY MULTIPLAYER ONLINE GAMES IN THE WORLD JUST EXPANDED INTO SPACE.



TEEN
T
Violence
ESRB CONTENT RATING www.esrb.org
Game Experience May Change During Online Play

PC CD-ROM SOFTWARE

LUCAS Arts

SOE
SONY ONLINE ENTERTAINMENT

Star Wars *Galaxies*: *An Empire Divided* *is required to play* ***Jump To Lightspeed.***

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Experience the **Star Wars** *saga with thousands of other players online.*

Make new friends and interact with players from around the world.

Live the force and seek out the ancient mysteries of the Jedi.

Hundreds of thousands of **Star Wars** *fans have been immersed in the epic struggle between the Galactic Empire and the Rebel Alliance in the highly successful massively multiplayer online game,* **Star Wars Galaxies®: An Empire Divided™**. *Now, the* **Star Wars** *community heads into space with this eagerly anticipated first expansion,* **Star Wars Galaxies®: Jump to Lightspeed™**. *Experience a whole new level of action-oriented gameplay and content that lets you jump into the cockpit of classic* **Star Wars** *starships and join the fight for the Galactic Empire.*

STAR WARS GALAXIES

JUMP TO LIGHTSPEED

www.swgjumptolightspeed.com

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respective owners. GB means 1 billion bytes. Total accessible capacity varies depending on operating environment. Maxtor OneTouch is an appropriate part of your overall data protection plan.
*File capacity figures provided by Jon Peddie Research. For details see jonpeddie.com

It's your bright idea. Keep it safe.

Your stuff is important. Save it. Store it. Back it up with the push of a button. Maxtor OneTouch II is the only external hard drive with room for up to 300GB worth of great ideas, industry leading software that lets you easily retrieve backed up files, and Maxtor DriveLock™ for added security. Think of it as your computer's new best friend.

***Maxtor OneTouch™ II* EXTERNAL HARD DRIVE**

The perfect place for all the things you love

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What drives you.®

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The GREAT GEEK GIFT GUIDE!

From the most cutting-edge workshop in the greater NoPo area: 20 of the coolest gadgets and gizmos for every tech head on your shopping list. That includes you.

METRO LAPTOP BACKPACK

Smart elves know—you'll whisk yourself through airport security if you have the Metro Laptop Backpack, with its quick-access padded pouch which lets you whip out your laptop without having to dig through your underwear and shaving cream. Plus, there's loads of storage for cables, mice, MP3 players, and even an extra green outfit lest you spill your latte on the first one. **$70,** **www.ogio.com**

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REDROVER AUDIO SOFTWARE REMOTE CONTROL

The RedRover module and foot pedal allows you to control your recording software from up to 10 feet away. Punch in, punch out, sync to the built-in metronome, and never again inadvertently whack the fretboard of your guitar against the LCD during an intense shred. Includes the full version of Adobe *Audition* sound editing software.
$430, www.adstech.com

GARMIN ETREX VISTA C GLOBAL POSITIONING SYSTEM

Elves can't carry much, so the eTrex Vista C's tiny dimensions are perfect for their wee pockets. What's more, it's waterproof (great for blizzards), the screen can be read in direct sunlight (lots of glare in the snow, you know), and it gets an amazing 20 hours of battery life from just two AA cells. **$428, www.garmin.com**

CASIO EXILIM EXZ55 5 MEGAPIXEL DIGITAL CAMERA

These days, everyone has a digital camera ready and waiting for the once-in-a-lifetime shot, but Casio's EX-Z55 significantly ups your chance of getting a crystal-clear pic of the Yeti. You're armed with a 3X optical zoom and can take up to 400 shots on a single charge. A gigantic 2.5-inch LCD means your eye won't be fooled by what turns out to be just some jerk in a gorilla suit.
$450, www.casio.com

RADIOSHARK

TiVo + Radio = radioSHARK. Pause a broadcast during potty-breaks or rewind to enjoy our President's verbal gaffes many times over! This USB-powered fin-like beauty will also rip straight from the airwaves to digital files; you can even schedule recordings ahead of time if you don't want to wake up at 6am to catch the first hour of Stern. **$70, www.griffintechnology.com**

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ROBOSAPIEN

When the machines take over the world and enslave us, remember that it all began with benevolent companions like the Robosapien. You have control (at least for now) over 67 pre-programmed moves and functions that can be chained together into, say, a mechanical belly dance to entertain holiday guests. Buy two and make one a Robosapiette!
$100, **www.robosapienonline.com**

STANTON DJ PRO 3000 HEADPHONES

DJs know a thing or two about headphones, and we've found the Stanton DJ Pro 3000 in more than one hipster's rubberized, racing-striped satchel. The comfortable closed-ear cup design defends against external noise, and the 50mm drivers, neomydium magnets, and gold plug deliver a clean, rich, thunderous sound. Groovy.
$130, **www.stantondj.com**

SOLID WOOD PERIPHERALS

Woe is the computer user whose traditional décor is marred by hard plastic and shiny metal. For him or her, there's no better gift than fine, natural wood PC peripherals. Each set is made from a single piece of wood, of which there are more than 90 types to choose from. All the wood comes from managed plantations, of course, so your PC will be, well, PC. Sets start at **$5,450,** **www.woodcontour.com**

IPAL

Although it's designed for fussy types and their precious iPods, the Tivoli iPal is a monophonic AM/FM radio that can be paired with any audio source via a line-in jack in the rear. The radio includes a built-in rechargeable battery, the sound is incredibly meaty, and the big, fat dial is a natural fit for our big, fat mits. **$130,** **www.tivoliaudio.com**

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M-AUDIO OZONE

Looking something like the piano Schroeder played for the Peanuts gang, M-Audio's killer keyboard and MIDI controller is a snap to configure, and the generous complement of assignable knobs lets you tweak your software synthesizer as you play. Got crappy onboard sound in your laptop? Don't sweat it. The Ozone sports 24-bit 96kHz mic and line level inputs for converting impromptu jam sessions into crisp digital tracks on your hard drive. **$300,** **www.m-audio.com**

PACIFIC DESIGN ROLLING DELUXE

Don't ask elves what kind of luggage they recommend—check out what they use. These feisty helpers appear partial to cases from Pacific Design. That's probably because today's elf carries a laptop, PDA, and no doubt a cell phone as well; Pacific Digital's rolling bags make space for all of these things, and remarkably, they don't look horrible.
$100, **www.pacificdesign.com**

DISCHUB

Thanks to the discHUB, we no longer have to fret about damage from stacking frequently used discs on top of each other. Just slip the CD into one of the neoprene-covered slots where it will sit snug as a bug in a rug until you need it next. **$8-15 (shipping included),** **www.dischub.com**

CD WALLPAPER

It might not be the fanciest cookie on the platter, but CD Wallpaper nonetheless makes a great gift. The sheet of translucent vinyl pockets lets you store 24 discs in the most space-saving of ways—on a wall (sturdy metal tacks come included). It's convenient, decorative, utilitarian, and cheerful—just like elves. **$9,** **www.thinkgeek.com**

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STAR WARS LIGHTSABER REPLICA

If lightsabers got any more realistic than this glowing replica for spoiled kids (complete with motion-activated sound effects), we'd have torn the office—and each other—to shreds by now. The first time you see the beam extend from the base to a full-fledged saber, you'll turn to the Dark Side just to get one.
$100, www.sharperimage.com

IGO PORTABLE AC ADAPTER

The iGo EverywherePower 3500 liberates pilgrims from that nasty nest of cables and chargers, allowing you to rejuvenate all your devices—phone, PDA, and laptop—on the go from a single power source. You can even charge two items at once: Is there a more romantic gesture than leaning over to your traveling companion on a starry night and offering to share your AC adapter? **$70 (tips sold separately), www.igo.com**

ICELINK

Let's face it—even the best iPod FM transmitter can be a pain in the butt. Trade up to the IceLink, which connects the line output from your iPod directly to your car's CD-changer control. Not only does the IceLink charge your iPod, it also lets you control your iPod from your car stereo! **$250 (price varies based on car model), www.denisonusa.com**

GV PENDANTS

Sean "Puffy" Combs' diamond-encrusted iPod may be somewhat over your budget, but geek bling is still within reach. These pendants from James Hakola dangle the great icons of arcade classics—Space Invaders, Tanks, et al—from a 30 inch chain. As Hakola puts it, "These are dog tags for the videogame war zone!" Puffy would approve.
$8 each, www.graphic-violence.com

FIREFLY PC REMOTE

After a hard day at the factory, elves like to get seriously sedentary back at the barracks, and nothing helps as much as the Firefly, a single PC hardware remote for all your media applications, elvish or otherwise. Kick back, pop open a brew, and blast your MP3s until someone throws a spangly boot at you. **$50, www.snapstream.com**

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SKYBOX

Who's worried about large multinational corporations outsourcing elf labor overseas? Not *this* elf! Instead, Pickles is enjoying a lengthy, restorative break with an ice-cold brew announced by a satisfying *tumble-THUD* from the Skybox, a personal vending machine manufactured by the appliance visionaries at Maytag.

Each of the four refrigerated bins in the Skybox can dispense up to 16 12-ounce cans or eight 12-ounce bottles with a simple, satisfying slap of the panel. You can lock up any or all of the bins to keep out the young ones, and even decorate the front and sides with custom art. Get the optional stand, and you've got a place for essentials like Pringles, Beer Nuts, and stogies. It's a perfect mate for the Barcalounger!

$500 (main unit), $70 (for stand), www.skyboxbymaytag.com

SUUNTO'S N3 SMART WATCH

Simple clocks are old hat these days; after all, you can find the time anywhere. This makes Suunto's n3 Smart Watch special indeed—provided you live in or near a major metropolitan area. It uses the FM band to receive customized news, weather updates, and—best of all—your *Outlook* calendar.

$199 plus $9.95/month or $59/year subscription fee, www.suunto.com

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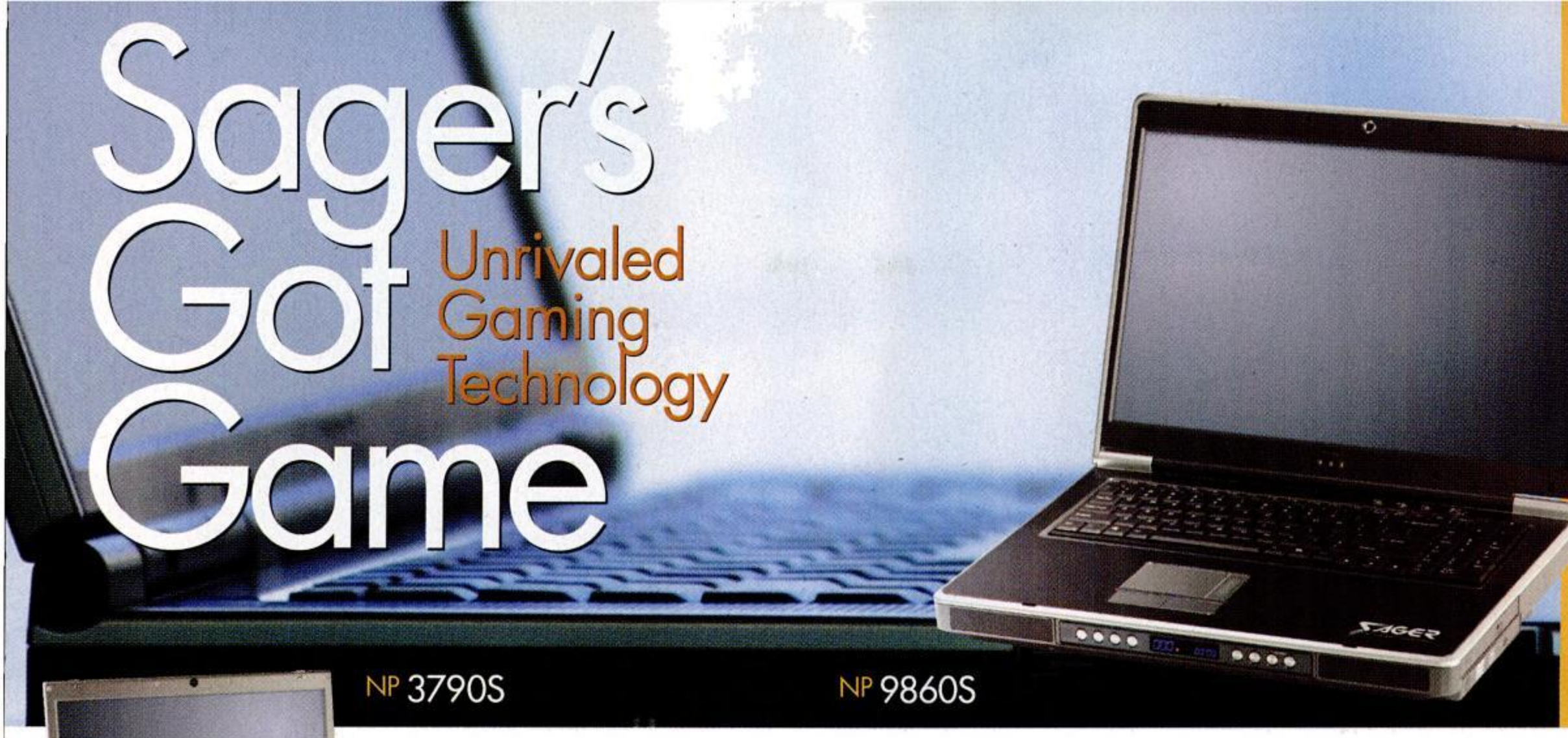
Sager's Got Game

Unrivaled Gaming Technology



NP 3790S

NP 9860S

Take your game to the next level!

Go beyond the limits of the conventional office. Sager notebooks provide not only the best business performance, but also the best gaming performance available. Loaded with the latest components, access today's business and gaming software with ease. Sager's power, speed and graphics surpass all others.

NP3790 FEATURES

- ATI MOBILITY™ RADEON™ 9700 with 128MB DDR delivers cutting-edge performance for 3D gaming and multimedia business applications.
- Built-In Digital Video Camera makes video chat and video conferencing easy.
- Built-In 4-in-1 Card Reader supports SD/MMC/ MS/MS Pro provides the fastest and easiest way to transfer your digital media.
- Using optical SPDIF output (5.1CH for DVD Movies) combined with the TV-out port you can watch DVDs on long trips or hook right into your home theater system.
- Communication on-the-go with integrated 802.11g Wireless LAN, V.90 fax/data Modem and 10/100/1000 LAN.

- **15.4" WUXGA Active Matrix Display**
- **Intel® Centrino™ mobile technology**
  - **Intel® Pentium® M Processor 745 (1.80GHz, 2MB L2 Cache, 400MHz FSB)**
  - **Intel® PRO/Wireless 2200BG LAN 802.11b/g**
- **128MB DDR ATI MOBILITY™ RADEON™ 9700 Graphics**
- **512MB PC2700 (333MHz) DDR SDRAM**
- **60.0GB 5400RPM Ultra ATA100 Hard Drive**
- **8X DVD²/24X10X24 CD-RW³ Combo Drive**
- **Built-In Digital Video Camera**
- **Built-In 4-in-1 Card Reader**
- **4 Built-In Stereo Speakers**
- Integrated Fax Modem⁴ and 10/100/1000 Ethernet
- Microsoft® Windows® XP Home Edition
- Sager's Umbrella Protection Policy

$1795

NP9860 FEATURES

- NVIDIA® GeForce™ Go 6800 PCI-Express™ Graphics Module with 256MB DDR2 Memory delivers new levels of performance, and the most vibrant, life-like graphics ever experienced on a mobile PC.
- Dual Channel DDR2 System Memory supports 400/ 533MHz, provides the best match for Intel® Processors and enables power efficiencies for data intensive business, multimedia, and gaming applications.
- Dual Optical Device bays allow this system to be customized with 2 CD-ROM devices for fast backup.
- The front panel Audio DJ CD player control with separate power switch lets you play your favorite music CD or MP3 while on the go.
- TV Tuner with Multi-Function Remote Control, so you will never miss any of your favorite TV shows again.
- Hardware Raid boosts HDD Speed with Raid 0 or mirror backup your data with Raid 1.
- Built-In Enhanced Digital Video Camera makes video chat and video conferencing easy.
- Virtual Eight channel external audio outputs eliminate the need for a decoder equipped speaker system.

- **17.0" Wide Viewing Angles WSXGA+ Active Matrix Display with Super Clear Glare Type Screen**
- **Intel® Pentium®4 Processor 560 with HT Technology (3.6GHz, 1MB L2 Cache, 800MHz FSB)**
- **256MB DDR2 NVIDIA® GeForce™ Go 6800 PCI-Express™ Graphics**
- **1024MB Dual Channel DDR2 SDRAM**
- **60.0GB 7200RPM Ultra ATA100 Hard Drive**
- **8X DVD+-R/RW¹ Dual-Mode Drive**
- **Full Size Keyboard with Numeric Keypad**
- **Built-In TV Tuner with Remote Control**
- **Front Panel Audio DJ with Separate Power Switch**
- **Hardware Raid 0,1 Function**
- **Built-In Digital Video Camera**
- **Built-In 7-in-1 Card Reader**
- **4 Built-In Speakers with a Subwoofer**
- **External USB 1.44MB Floppy Disk Drive**
- Integrated Fax Modem⁴ and 10/100/1000 Ethernet
- Microsoft® Windows® XP Home Edition
- Sager's Umbrella Protection Policy

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intel inside HT pentium 4

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MATURE 17+
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CONTENT RATED BY ESRB
Blood and Gore
Intense Violence

PC CD ROM

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HALF-LIFE 2

"NOTHING WILL EVER BE THE SAME"

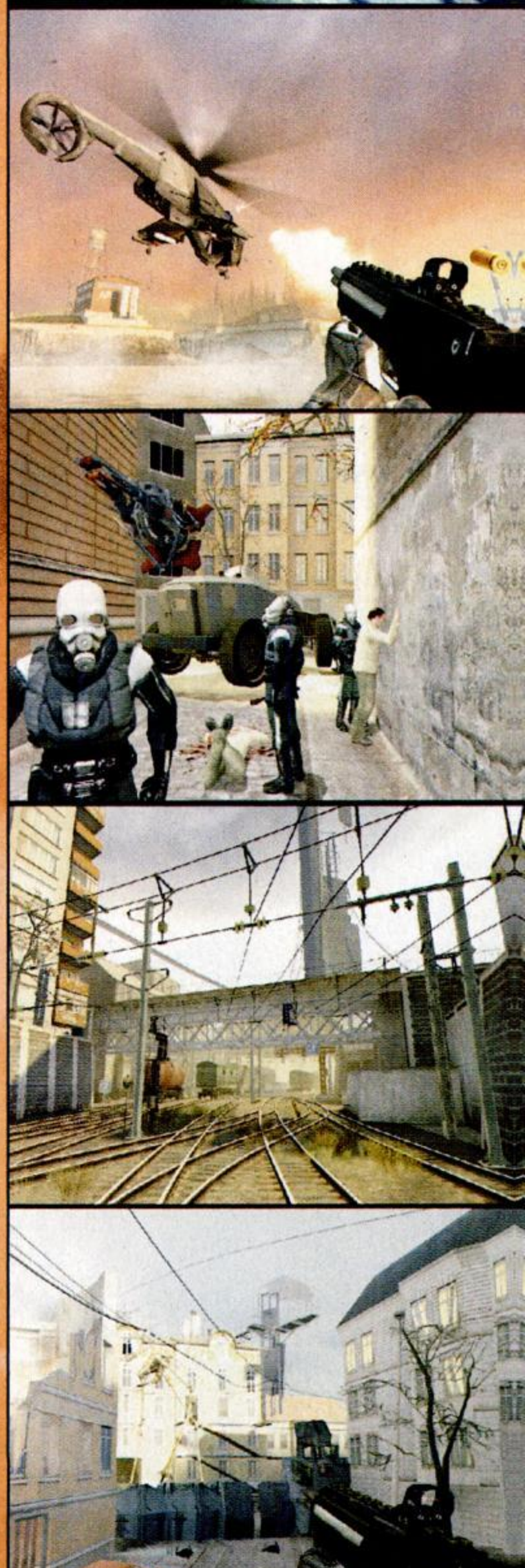
GAME INFORMER

"...THE BEST GAME EVER MADE"

PC GAMER

1998. Half-Life® sends a shock through the game industry with its combination of pounding action and continuous, immersive storytelling. Valve's debut title wins more than 50 game-of-the-year awards on its way to being named "Best PC Game Ever" by PC Gamer, and launches a franchise with more than eight million retail units sold worldwide.

NOW. By taking the suspense, challenge and visceral charge of the original, and adding startling new realism and responsiveness, Half-Life 2 opens the door to a world where the player's presence affects everything around him, from the physical environment to the behaviors even the emotions of both friends and enemies.



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COUNTER-STRIKE SOURCE™

The Next Generation of the #1 Online Action Game.*

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Tackling Tivo

With a brand-new interface and a wide range of functionality, can the Media Center PC dominate the living room? We show you how the new Media Center OS works, review five of the latest Media Center PCs, and compare the experience to everyone's favorite—Tivo

BY GEORGE JONES

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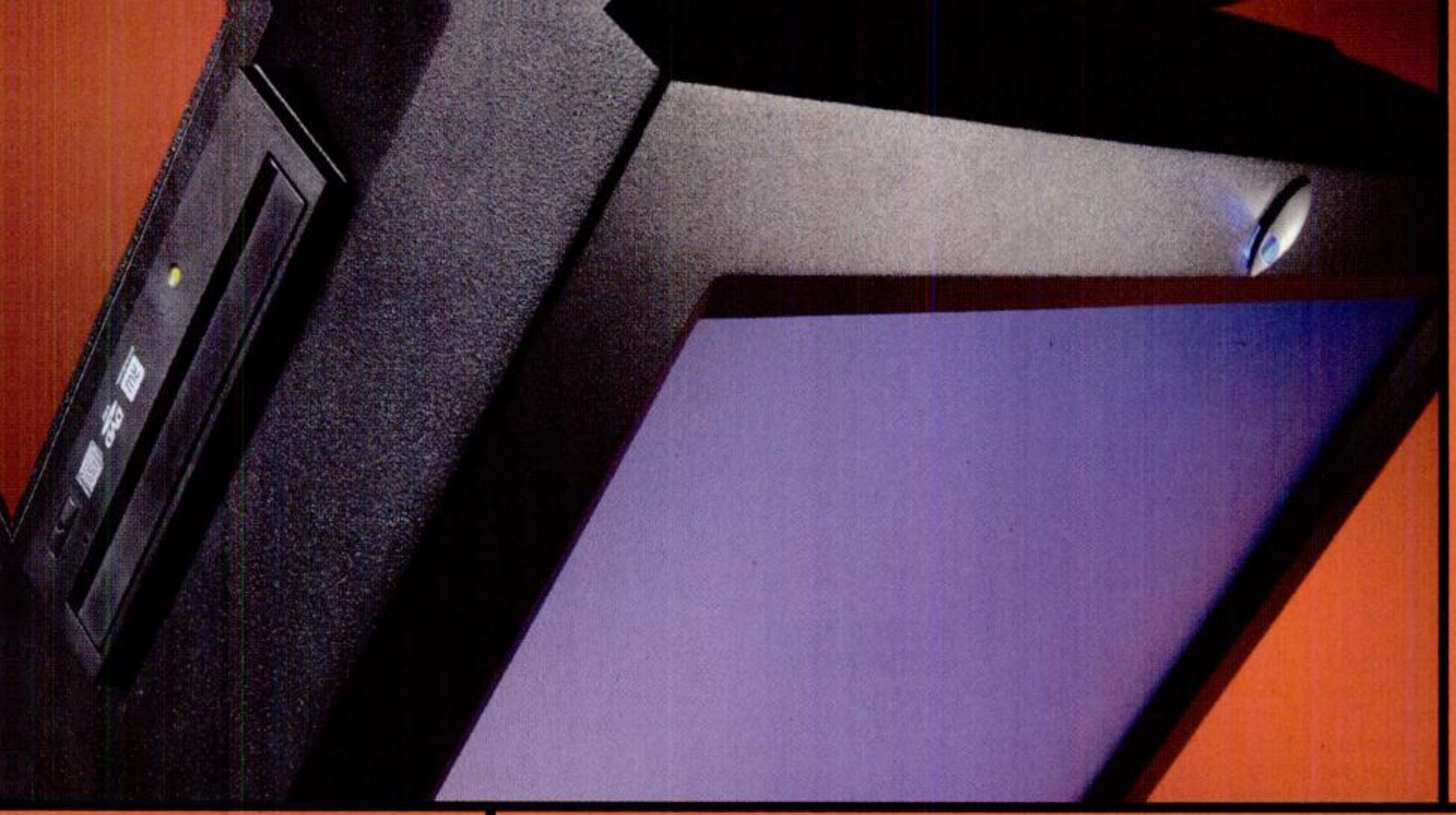


As far as concepts go, the Media Center PC sounds pretty appealing. Theoretically, it merges your bulky receiver, DVD player, and Tivo into a single network-able unit that can manage your entire library of music, photos, TV programs, and movies. Who wouldn't want that?

But—and if you're an early adopter, you already know this—the gap between concept and reality can be wide, deep, and frustrating. For this reason, Tivo serves as the zero point—the control, if you will—for *Maximum PC's* first in-depth look at this newest evolutionary offshoot of the PC.

Over the years, Tivo has achieved high marks for its personal video recording (known as PVR) and networked media-management abilities. With a simple-to-use, highly evolved interface, it has certainly won over its share of converts. But Microsoft has made an aggressive and quite promising effort to stake out some turf of its own in the living room with its Media Center OS. In the following pages, we examine how the 2005 version of the Microsoft's operating system fares in comparison with Tivo.

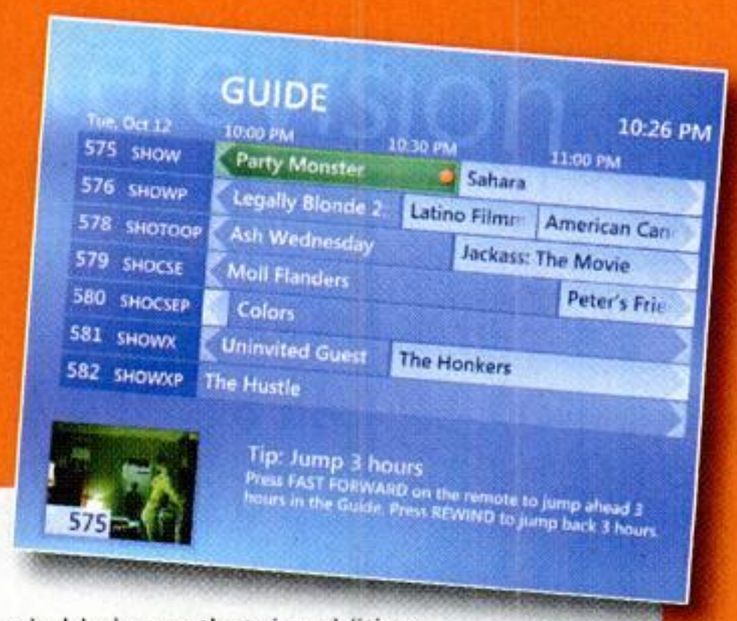
Before we start, two quick notes: First, this new OS can only be purchased with a new PC or a "non-peripheral" hardware component, meaning a hard drive, CPU, or mobo. Second, if you have an old version of the OS, the only way to upgrade is to contact the manufacturer, but you may be out of luck.

So is the Media Center right for you? Read on to find out.

MEDIA CENTER 101:

Introducing WinXP: Media Center Edition

Chances are you haven't seen much of Windows XP: Media Center Edition 2005. So before we look at the hardware, let's take a quick spin through the OS' most prominent features.



THE GREEN BUTTON

It all starts here. Per Microsoft's spec, the centerpiece of the remote also serves as the informal icon for Media Center. The green button functions similarly to the Tivo button on Tivo remotes; whenever you press it, you're taken to the Media Center start page and the interface you see below.

While Media Center remotes come in a wide variety of shapes and sizes, there is a standard spec dictating where the buttons are positioned in relation to one another. We've heard rumors, however, that this spec is about to change. That's a good thing—while we like the green button, we found it difficult to find a "home" location for our fingers when using the Media Center remotes. In addition to being easier to use, Tivo's directional-pad style of navigation makes it easier to transition from menu navigation to the fast-forward, reverse, and play buttons.

RECORD YOUR FAVORITE TV SHOWS

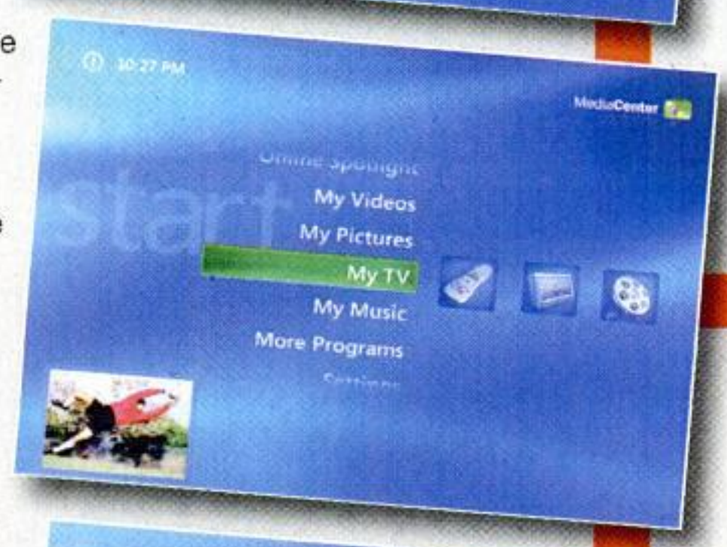
Even if you don't have a Tivo, you probably know that, in addition to allowing you to pause live television, the device also allows you to quickly and easily record TV shows.

Media Center enhances Tivo's notions of PVR (personal video recording) functionality by minimizing the TV viewing area to the bottom left-hand corner of the screen while you're browsing the built-in program guide, plus it has a full color interface. Also nice: The new 2005 version of Media Center allows you to instant message (MSN Messenger only) and chat with your friends while watching TV.

Finally, the 2005 version of Media Center includes two built-in tuners, and features support for a third HD tuner, which allows you to hook two standard cable/satellite boxes and one HD box up to the same PC. Conveniently, the Media Center OS will automatically switch between them when necessary, which means that you can watch TV while recording two different shows.

THE DIRECTED INTERFACE

Media Center is essentially a Windows applet. It runs on top of Windows XP (when you boot, it replaces the Windows desktop). The 2004 version forced you to manually launch the Media Center interface from the WinXP desktop. The 2005 version, which emphasizes the "10-foot" experience—Microsoft parlance for allowing you to control everything with your remote control—launches directly into Media Center.

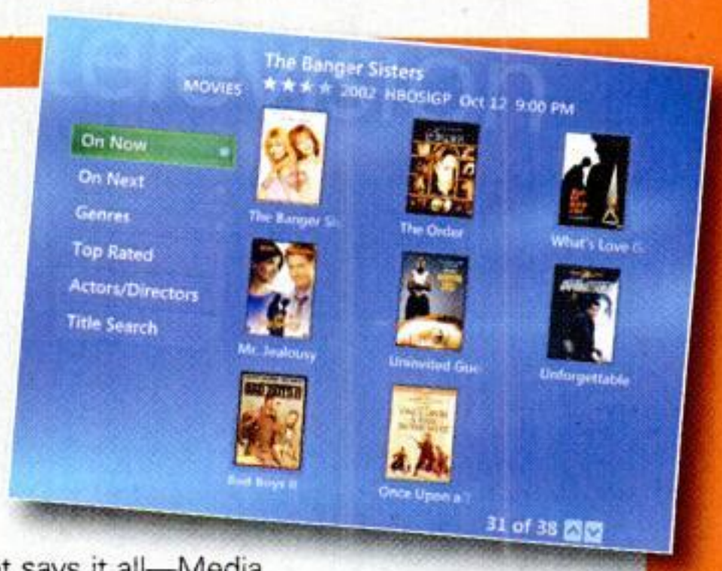


Media Center looks and feels like a completely separate OS. For example, it features a unique "directed interface" that allows you to use your remote to scroll through and select a usage mode—pictures, TV, music, etc. From there, the 2005 version lets you drill down into further options without reverting to the main menu.

"Right-click" functionality, which allows you even more contextual options, like burning audio CDs within the Music section, can also be accessed in the new version by pressing the "More Info" button on the remote.

Finally, here's a tip: If you have an old version of the Media Center OS and want to boot straight into Media Center, simply drag a shortcut of the green Media Center icon into your Startup folder.

MOVIE WATCHING: MUCH BETTER THAN TIVO



Although recording and watching movies is a sub-function of recording and watching TV, the manner in which the 2005 version of WinXP Media Center Edition allows you to sort, browse, and select movies to watch and/or record is truly amazing. This screenshot says it all—Media Center automatically aggregates all the movies currently playing on all the channels you receive, and includes the thumbnail movie posters for those movies. You can also see what movies are on next, and sort these and all other movies appearing in the next two weeks by star rating, cast, genre, and a few other categories. This is indispensable for movie buffs—you can sort through all the movies for the next two weeks and set them to record. Assuming you have the hard drive space (two-hour movies take up about 2GB each), you can build a massive library of recorded films!

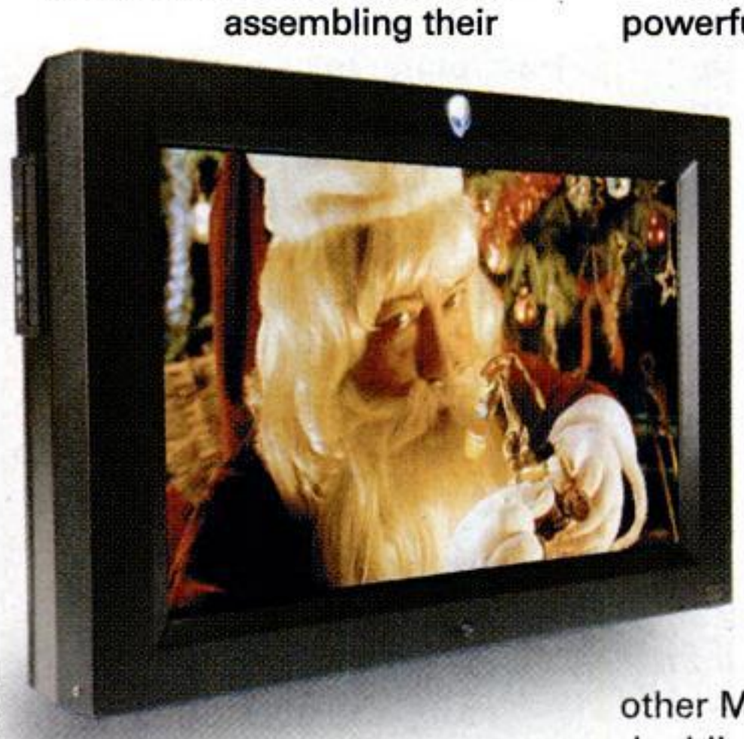
MUSIC AND PHOTOS

In addition to recording TV and allowing you to watch DVDs, WinXP Media Center Edition also organizes all of your music and photographs into one, easy-to-use package. This is particularly nice if multiple people use your PC; rather than wade through each individual "My Documents" folder, you can aggregate them all in Media Center. Even though you can play slide shows, and choose music to accompany them, it would be nice if this process was automated or made easier. As it stands now, you have to first choose your music, then choose the slide show. In a nice touch, the slide show automatically pans across your photos during play.

New to the 2005 version of Media Center Edition: The OS automatically detects if you're on a network and asks if you'd like to add any shared folders to its library. This is nice if you store music files on different PCs in your house, even at the relatively low data transfer rates of Wi-Fi. Additionally, the OS includes a utility that will convert all your music files into WMA or WMA lossless format.

Alienware DHD-305

Each of the PCs you'll read about offers a unique interpretation of the type of functionality, power, and formfactor a Media Center system can possess. Unexpectedly, we found ourselves unable to shake the feeling that in the process of assembling their



Media Centers, each manufacturer makes a clear statement regarding their fundamental PC-building philosophy.

As an example, consider Alienware's DHD-305, which melds a feature-laden, high-powered PC and a beautiful 30-inch widescreen LCD display into a single unit. Hy-Tek manufactures the DHD's integrated chassis—astute readers will remember our February 2004 review of the company's similar-looking Tek Panel 300.

Ostentatious, versatile, and powerful, the DHD embodies Alienware's notions of PC design. While we found ourselves puzzled by the low *Halo* benchmark score of 41 frames per second—the Media Center app definitely creates some slowdown, but it can be closed for optimum performance—the DHD outpaced all the other Media Centers, often doubling the scores of the competition. In real-world tests that consisted of web-browsing and e-mail checking while the Media Center simultaneously recorded live television, all of the Media Center PCs exhibited a moderate to slight clunkiness; we found that the DHD's P4 Extreme CPU (with an 800MHz FSB) minimized this slowdown the most.

On the storage front, the massive 400GB Hitachi SATA drive (we consider big drives a necessity in all Media Center PCs, given their nature) means you can store tens of thousands of songs and pictures as well as record hours of TV shows and movies. We also appreciate the built-in 8-in-1 media reader, which allowed us to move photographs directly from a camera into the Media Center.

The drawback to this much power is that the DHD generates a considerable amount of heat; over the course of a few hours, it raised the temperature in a slightly ventilated 12x12-foot room by five full degrees. The DHD is surprisingly quiet, however. In fact, if it weren't for the bright blue light emitted by the glowing eyes of the Alienware logo mounted at the top of our test model, this system would make for a perfect bedroom entertainment center.

We were impressed with the DHD's reliability. In marked contrast to a few of the Media Center PCs we tested, during the course of our extensive two-week test period, we experienced only a few instances where the system crashed and/or failed to come out of sleep mode, thereby preventing us from recording our favorite TV programs.

Now for the downside: At almost $8,000, the DHD is, as we say, hella-pricey. Granted, the price includes a high-quality large-size LCD, but therein lies the rub. Buy the DHD and you are essentially locking yourself into a 30-inch display for the life of this Media Center. As much as we hate to say it, 30 inches just isn't that big for the living room these days, making this rig more appropriate for your office, bedroom, or dorm room. Thankfully, Alienware also offers the DHS—a more traditional, no-LCD-included Media Center PC for $1,800.

VERDICT 8 | **$7,930.00**

www.alienware.com

How We Test Media Centers

Testing Media Center PCs presented the Maximum PC Lab with an interesting and unique predicament: Typically, our system reviews revolve almost primarily around two key factors: performance and reliability. However, Media Center PCs are a unique breed; while performance remains important, we considered real-world functionality and reliability critical. Here's the suite of tests we used this month:

▶ **REAL-WORLD TESTS:** To test this batch of PCs, we spent two weeks rigorously using each system in our living room. This entailed a large number of hours of TV watching, but we were up to the task. We recorded at least 25 different programs at the highest quality level with each rig and tracked the number of failed recordings as a result of crashes or other malfunctions.

A special adjunct to this real-world testing is a rarely used *Maximum PC* test we call *SpouseMark 2004*. This test entails encouraging our spouse or partner to regularly use the Media Center and report how easy it was to use and how reliable the experience was, particularly in comparison to Tivo.

An interesting side note: During our testing, we discovered that the WinXP Media Center application appears to create a 20-30 percent performance hit in general WinXP computing when the TV watching capabilities are in use. Gaming performance appears to suffer a more substantial hit during Media Center operation. We'll be investigating this more and reporting more specific numbers in a coming issue.

▶ **BENCHMARKS:** After considerable discussion, we pared down our usual suite of system tests to three: *Doom 3* measures high-end gaming performance and *Halo* measures videocard/CPU performance. Additionally, because we found ourselves turning these rigs off and on so much in order to avoid the noise and heat they generate, we also found it important to measure how long it took for them to come out of standby mode. In effect, this measures how long it takes to "turn on the TV."

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HP Media Center Photosmart PC

Squat, compact, versatile, and inexpensive, HP's take on the Media Center phenomenon impressed us with a few elegant and functional innovations.

With a Pentium 4 520 (that's a 2.8GHz P4 Prescott with an 800MHz frontside bus), half a gigabyte of memory, and a Radeon X300 SE PCI-E graphics card at its core, the HP Media Center didn't win any performance contests. In fact, with the exception of Toshiba's Qosmio laptop, it placed last in our *Halo* and *Doom 3* benchmarks—a clear indicator that this is no gaming machine.

But what the spunky-looking PC lacks in speed, it makes up for in versatility. The top of the Media Center features a built-in dock for HP Photosmart digicams—letting you easily dock your camera and extract photographs. Even more impressive is the presence of the HP Personal Media Drive, a removable extra 160GB hard drive (the system comes equipped with a 160GB 7,200rpm internal drive as well) that functions like a VCR cassette. This drive, which draws its power from a built-in USB 2.0 port, plugs right into the front of the PC and can function as a backup drive or as a means of permanently storing TV, music, and more. Extra drives can be purchased for $250 each. A 9-in-1 media card reader rounds out the storage capabilities.

Unfortunately, these innovations are all rendered moot by the fact that our test system continually crashed when going into and out of sleep mode. A PC crash during a gaming session is frustrating; missing Game 2 of the Yankees-Sox series because of a crash is a cardinal sin; this forced us to leave the HP Media Center on at all times. Hey, at least the mild-mannered components mean it can operate quietly and coolly in your living room.

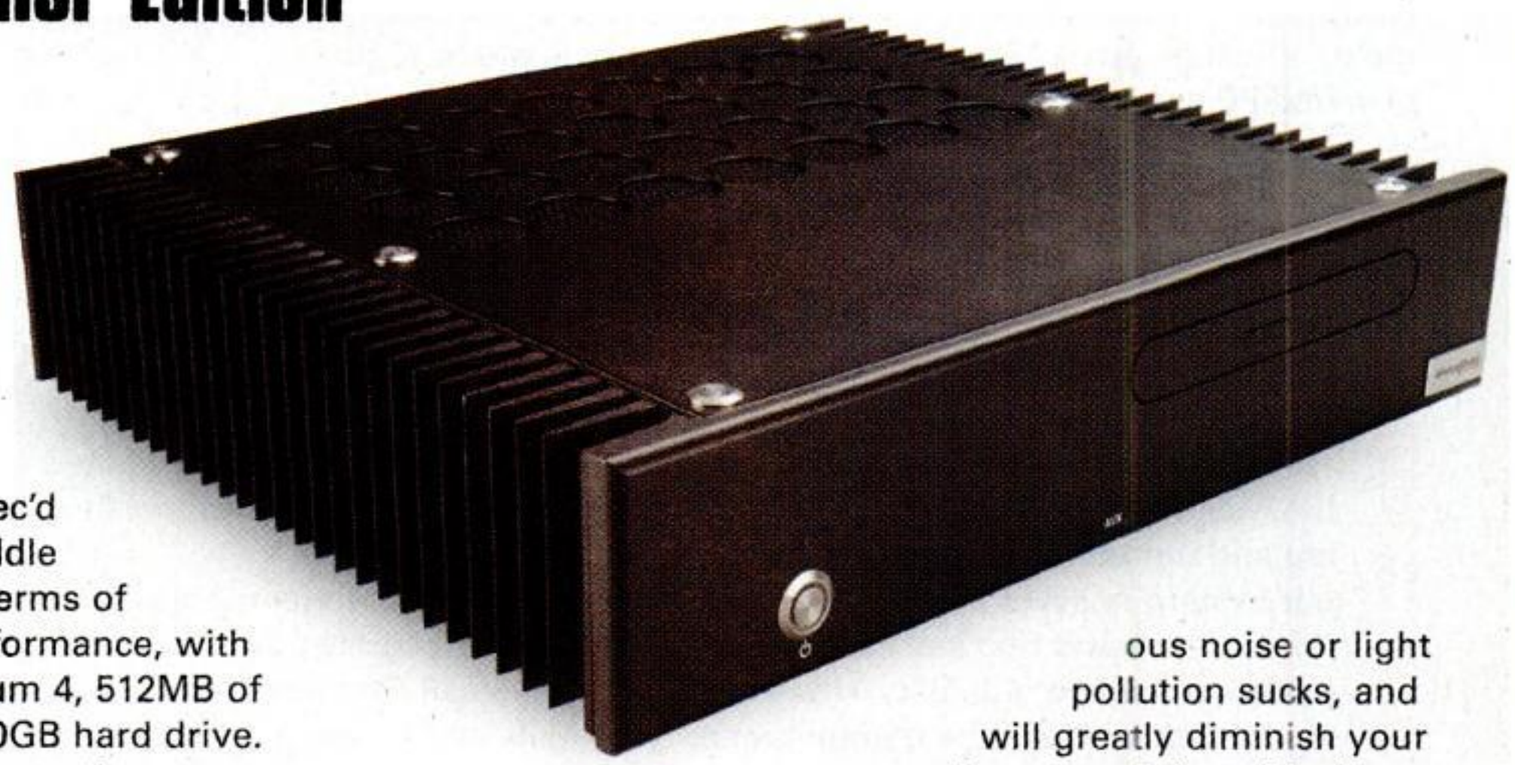
VERDICT 5 **$1,600**

www.hp.com

Niveus Media Center: Rainier Edition

Niveus, a small PC shop located in Los Gatos, California, won our hearts with the Rainier Edition. The company's elegant approach to its first Media Center PC has resulted in a cool, nearly silent system that deserves a rightful place in the living room.

That's right, we said silent. While not necessarily critical in conventional desktop PCs, we found silence to be a rare treat while testing this batch of Media Centers. Contrary to the nearly complete lack of sound generated by a Tivo unit, the wheezing and whining PC fans drove us crazy. This made the fanless design of the Rainier Media Center extremely appealing. The system's case is essentially one large heatsink and features long, thin fins up and down each side of the chassis. Also gratifying: The lack of any lights on the PC's case. This allowed us to set up the Niveus rig wherever we wanted, without fear of intrusive, movie-disturbing light pollution.



Our test system was spec'd right in the middle of the road in terms of power and performance, with a 2.8GHz Pentium 4, 512MB of RAM, and a 160GB hard drive. In benchmark tests, the system's Radeon 9600XT placed it second (behind Alienware) in *Halo* and *Doom 3* tests. (Optional upgrades include a 3.2GHz P4, 320GB hard drive, and nVidia GeForce 6600 PCI-E videocard.)

The Rainier impressed us with its reliability. Of the systems reviewed here, it crashed the least, meaning it rarely failed to record the programs we specified. Still, any amount of crashing—even two times out of 100—is unacceptable, particularly when Tivo, the Media Center's primary competitor, has a failure rate of well below 1 percent.

Whether we were testing in our living room, office, or bedroom, one thing became painfully clear to us: Any extraneous noise or light pollution sucks, and will greatly diminish your enjoyment of these Media Centers. For this reason, we found Niveus' silent approach the best of the batch. For now, you'll be hard pressed to find a more appropriate Media Center PC for your needs.

VERDICT 9 **$3,000**

www.niveusmedia.com

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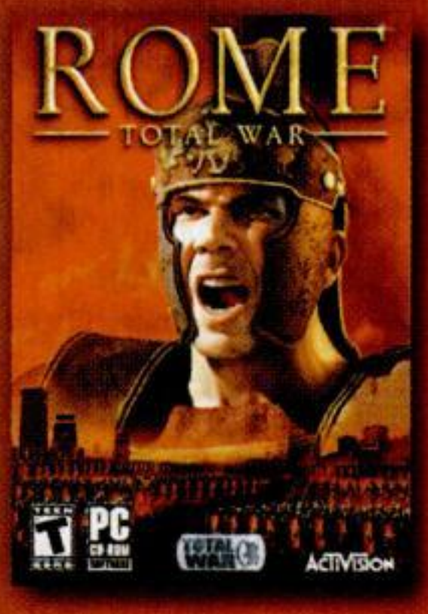

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Toshiba Qosmio

The Qosmio's versatility and portability make it a dream for anyone who is constantly on the go. When it's sitting on your desk, it functions as a standard Media Center PC, with the added perk that when you travel, you can take your entire library of recorded TV shows and movies with you. A traditional Media Center remote control allows you to control the OS from a distance.

We have a small concern with the use of a proprietary D-port video-out connector between laptop and television. Traditional desktop Media Center PCs connect to cable boxes and/or satellite receivers via standard RCA or S-video cables, which are more easily replaced than the D-port cable.

The Qosmio's 1.7GHz Pentium M CPU makes it relatively speedy for basic tasks, but—and this should come as no surprise—this is no gaming rig. It placed last in testing. Of greater concern is the 80GB drive. At 1GB per one-hour show, this will limit your recording capabilites. Pairing the Qosmio with a larger external drive would be a good solution. The laptop supports 802.11b and g wireless, as well as Bluetooth.

Weighing in at a little less than 10 pounds, the Qosmio compensates for its awkward name with a sleek, sophisticated look and an awesome 15-inch widescreen display that is one of the best and brightest screens we've ever seen on a laptop. We were similarly surprised at the rich-sounding audio generated by the built-in Harman Kardon speakers, although we were disappointed with the relatively quiet maximum volume setting. Battery life is decent at a little over two hours when playing movies.

One of the most interesting features is the instant-on capability, which allows you to watch DVDs, live TV via the TV tuner (without the Media Center PVR functionality), and listen to audio CDs. The quality of DVD playback in this mode is inferior to normal Windows-based playback, but it's nice to not have to wait for your TV to turn on. A separate remote allows you to control this non-Windows functionality, which we found slightly baffling. Why not integrate the two?

Road warriors will love Toshiba's novel take on the Media Center, but we'd prefer a straightforward and more powerful PC for our living room.

If you carry your laptop around, you're not going to be able to record much TV.

VERDICT 7 **$2,600**

www.toshiba.com

Benchmarks

How do you measure Media Center success? One number at a time.

Benchmarks	Alienware	HP	Niveus	Toshiba	iBuyPower
DOOM 3 (FPS)	**17**	7.3	16	3	7.3
HALO (FPS)	**41**	12.6	21	6	15
BOOT TIME (SEC)	48	**20**	44	26	34
WAKE UP FROM STANDBY (SEC)	**4**	10	8	6	8

Best score are bolded.

iBuyPower Media-XP

Simple and subtle, with a decent amount of power under the hood, iBuyPower's Media Center PC is the most traditional-looking PC of the batch reviewed here.

The Media-XP uses Silverstone's classy-looking LC03 case enclosure, which appears to have been custom-made to house Media Centers. Flip-down doors cover the drives and give the case an elegant living room aesthetic, and the only light emitted is from a low-level blue LED behind the power button. Unfortunately, the Silverstone case does not excel at reducing noise. While running, it sounds like a small jet—largely a byproduct of the GeForce 5900's obnoxious fan—making it a poor choice for the bedroom or living room. Furthermore, we cut the hell out of one of our fingers sliding off the top of the case—ouch.

A 3.2GHz Pentium 4 CPU and GeForce FX 5900 provide the muscle; the result is a system that's decent for gaming; iBuyPower's rig placed in the middle of the pack in our benchmark tests. Stability was acceptable— we only experienced three crashes over the course of recording TV shows and movies.

iBuyPower has made its name building inexpensive PCs that offer solid performance but lack the bells and whistles of more high-end, boutique shops like Alienware. The Media-XP is no exception to this rule; while it does feature an integrated 8-in-1 media reader, there are no other extras. As a result, the rig puts forth a lot of power and won't empty your checking account.

If you can handle the noise level, the Media-XP would make for a fine office entertainment system.

VERDICT 7 **$1,500**

www.ibuypower.com

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Head2Head

A showdown among natural PC competitors

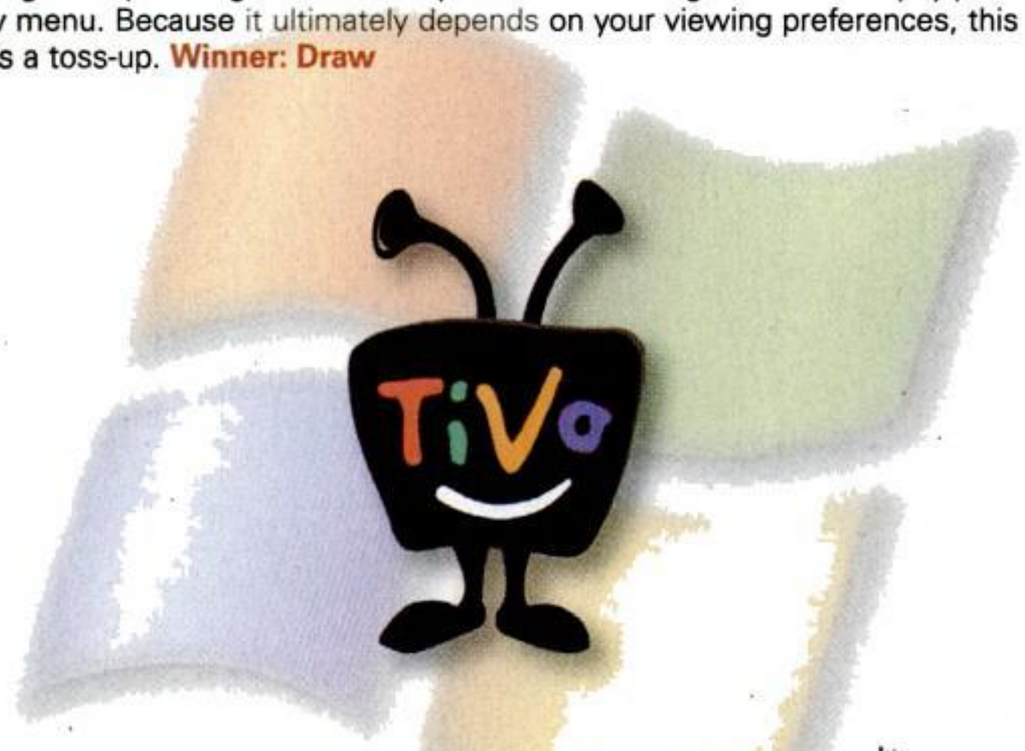
WinXP Media Center vs. Tivo

Can the new incarnation of Microsoft's living room OS beat the original personal video recorder? It's time to find out!

PVR functionality: Both Tivo and Media Center allow you to quickly and easily pause live TV and record future shows. Both allow you to extend the stop times of your recordings—very important for live events like sports. Unfortunately, both also suffer from the same annoyance: If you pause a TV show and walk away right before a scheduled recording, you'll miss the prompt that asks you if you want to stay on your current channel or start recording the new program. This could cause you to miss the rest of the show you paused.

While it's a rare situation these days, if you have multiple cable boxes in your living room, Media Center 2005's built-in multiple tuners eliminates this problem; the box will automatically resolve the conflict by switching to the second or third tuner. This combined with the fact that a PC provides much more storage capacity, gives the nod to Media Center.
Winner: Media Center

Interface: The Tivo and Media Center interfaces both present legible text, high-visibility colors, and easy-to-understand menu options. For standard TV viewing, Tivo allows you to see more upcoming programs onscreen at a time for any given channel, which makes for easier recording. But people who watch a lot of movies on TV will fall in love with Microsoft's innovative and incomparable movie-viewing interface, which allows you to browse through currently playing and upcoming movies as if you were selecting them from a pay-per-view menu. Because it ultimately depends on your viewing preferences, this one's a toss-up. **Winner: Draw**



Reliability: This category is a big one. Media Center crashes coming in and out of sleep/hibernation modes. Microsoft told us this is primarily due to driver-level faults, and that, more often than not, videocard drivers are to blame. This is a massive setback for Media Centers; if your PC crashes upon waking up, it won't be able to record your favorite shows and movies. In stark contrast, over the four years we've used Tivo, we've witnessed only three crashes. **Winner: Tivo**

Advanced features: Both Tivo and Media Center have a nice set of advanced features. Both can be integrated into your home network (although Tivo charges you for the privilege). Interestingly, one of Media Center's standard features—the ability to listen to your music library and view photos—is an optional feature for Tivo. But there are a couple of kickers: You can set Tivo to record over the Internet, and Tivo goes out and records TV shows it thinks you'll like without any prompting from you. Media Center counters this round to a draw, however, with two big 'uns: First, optional Media Center extenders (due to be released in November, including one for Xbox) will allow you to access your Media Center from any TV in the house.

Second—and this is the ultimate advanced feature—a Media Center is a fully functioning WinXP PC.
Winner: Draw

Cost: Tivo costs $130 and includes a $12.95 per month fee, or a $300 lifetime fee, which provides the service for as long as you use your Tivo. Media Center PCs cost $1,500 to $2,500. But before you jump to any conclusions, consider this: When combined with a high-quality set of PC speakers, a Media Center PC can (and should) replace your DVD player and your expensive receiver/amplifier. Tivo can't. Even so, Tivo's cost is hard to beat. **Winner: Tivo**

THE UPSHOT

When we first dove into this Head2Head a few months ago, we thought Tivo would simply blow WinXP Media Center Edition out of the water. Microsoft's release of the 2005 version of the OS, however, leveled the playing field a bit by providing a more powerful and deep interface that's even easier to use than before, and the ability to easily scan and record movies.

The categories indicate that Tivo wins by a final tally of two-to-one, but in our minds this contest isn't even that close because of one reason: reliability. Simply put, Tivo rarely, if ever, fails us. Crashes are virtually nonexistent on its Linux-based platform. Media Centers are another story. PCs crash, and crash regularly, and missing a scheduled recording because of a crash or lock-up is inexcusable.

With this said, if Media Center can overcome this critical shortcoming—and its no small task given the wide range of hardware and driver combinations—we see a potentially bright future for the platform.

Tivo wins—for now.

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Blood
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Runs great on intel inside pentium 4

PC CD-ROM SOFTWARE

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Ask the Doctor

Symptom ▶ Diagnosis ▶ Cure

A CASE OF THE FUZZIES

I recently purchased a GeForce FX 5200 videocard, and I'm currently using an RF adapter to output the S-video to my 25-inch TV so I can watch DVDs from my PC. I can get *CyberDVD* to output to my TV but it looks fuzzy. Is there a way to get a clearer picture?

—JOSHUA SCHLATTER

Picture quality with an S-video output is poor as a general rule. And we can only imagine how craptacular it must be if you're using an RF adapter. The Doctor recommends lowering the resolution as much as possible—think 640x480 maximum, which is the optimal resolution for a standard TV anyway. Beyond that, there's really not much you can do to improve the picture.

DOUBLE YOUR FUN

Alienware has proved you can put two videocards into one rig, but what about soundcards? I have several rooms wired for sound and would like to have a central server playing different audio files in each room without the need for multiple PCs either on the server end or in the rooms. Is there a way to have multiple soundcards (or even just sound streams) coming from one PC?

—ANONYMOUS

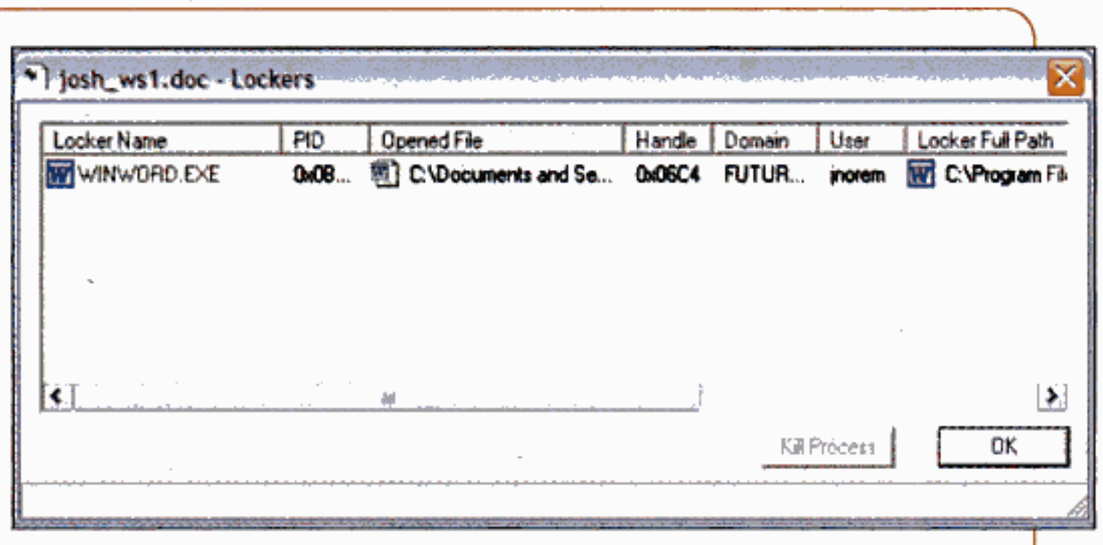
You can indeed run multiple soundcards in the same system; however, Windows only lets you stream audio to one of them. We know of a couple hardware solutions that circumvent the OS. For instance, the Platinum version of the Audigy 2 ZS allows you to run the headphone as a separate output, and most motherboards that feature Intel's "HD Audio" let you run two separate audio streams. But in these cases, you're not only limited to just two streams, but analog signals sent over long cable runs (which you'd likely need to reach other rooms) tend to degrade significantly. Instead, we recommend setting up separate streaming boxes in each of the rooms you want music in.

With the audio piped over a network, the sound quality will be much better. Plus, a streaming box gives you the ability to change tracks, adjust volume, and even switch to a different playlist without needing to be at your PC. Our current favorite audio streaming box is the Squeezebox (www.slimdevices.com). It's available for $200 in a wired version, or $280 for a version that accepts both wired and wireless connections.

UNINSTALL IT ALL

I have a 2-year-old Dell computer. Over the years there have been many installs and uninstalls of programs. Sometimes files are left over from an uninstall, and when I try to delete them I get an error message. It says "Cannot Delete temp: Access is denied, make sure the disc is not full or write protected," and the file is not in use.

—MAC KAUFMAN



***WhoLockMe*? It might not be the paragon of proper grammar, but the utility makes it a lot easier to discover which app "locked" your files.**

Ever hear of the "tread lightly" ethos? You know, making sure to clean up your campsite on departure and never leaving empty beer bottles on the beach. Unfortunately, many software programmers don't live by such a code. Even after being uninstalled, programs often leave a load of code crap in their wake. This leftover detritus can make hard drives more fragmented, take up precious drive space, and lead to system instability along the lines of what you're experiencing. Luckily, you have two options. First, reboot your PC, and with nothing running, try to delete the unwanted files again. If they're still not accessible, boot into Safe mode by pressing F8 during start up. This mode runs Windows with the minimum amount of drivers and doesn't load any applications, so whatever errant app was claiming your files won't be running, making it possible for you to delete them.

If neither of those approaches work, download *WhoLockMe* (perform a Google search to find it). It's a cool utility that integrates into the Windows shell, allowing you to right-click any in-use file and select "wholockme?" to show which process has locked the file in question. You can then shut down the process and delete the file.

> ***"EVEN AFTER BEING UNINSTALLED, PROGRAMS OFTEN LEAVE A LOAD OF CRAP IN THEIR WAKE."***

CHECKSUM ERROR

My computer (Biostar motherboard M6VLQ, 1.3GB Intel processor, and 256MB of memory) shows me a message, "CMOS checksum error- default loaded," when I boot. What can I do to correct this error? Please help me.

—MIGUEL ACEVEDO

Your PC's CMOS, which stores settings for the BIOS, such as boot order, has been corrupted. This can occur from a little static electricity, a failing CMOS battery, or even a bad mobo. First try replacing the small coin cell battery that saves all the settings. If that doesn't work, you should reset the BIOS. Do this by unplugging the power that goes into the power supply and either waiting 10 seconds or hitting the power button to discharge the remaining energy in the power supply. Then look for the jumper on the motherboard that's used to reset the BIOS—it's usually near the coin cell (look in your motherboard manual if you can't find this jumper).

Change this jumper to the reset position and leave it for four or five seconds, then put it back in its original location. Plug your PC back in and power up the system. Hit either F1, F2, or the Delete key while booting to go into the BIOS. From there, load the default settings, make sure the system time and date are set and the boot order is correct. Save your settings, exit the BIOS, and reboot. If you are still getting error messages after these steps, than you may want to consider flashing the BIOS with the latest ROM available from the motherboard maker. If that fails, it may indicate that the board itself is failing.

YOU BETTER RECOGNIZE

I recently purchased a used Maxtor hard drive and installed it as a secondary drive in my

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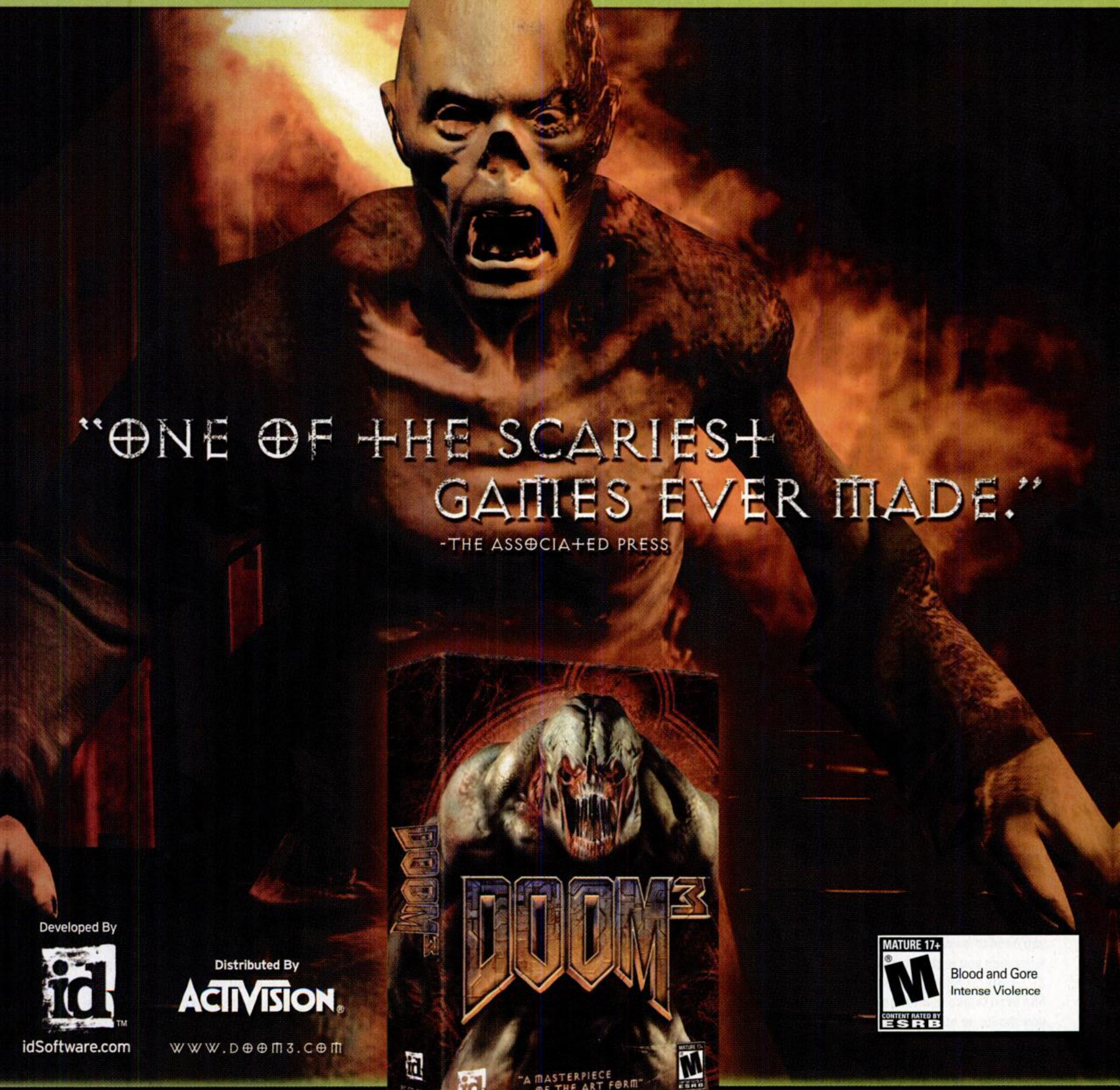

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PC. Maxtor's web site says the model is a 40.9GB hard drive, but Windows XP Pro will only recognize it as a 7.82GB hard drive. What gives?

—FRANK

You need to update your BIOS. If you recall, BIOSes made around 1998 were limited to 8GB, but newer BIOSes upped the limit to 137GB. Today, as you know, drives are way bigger than 137GB, so yet another BIOS update was developed for support up to 144,000,000GB, which should cover us for at least the next decade. Either update your BIOS or go to www.maxtor.com and download *Maxblast* from the Software Downloads section. This utility "breaks the 528MB, 2.1GB, 4.2GB, 8.4GB, 32GB, 64GB, and 137GB capacity barriers," according to Maxtor.

TRI-MONITORS A REALITY?

I'm currently running two 17-inch LCD monitors with a PNY GeForce 6800 GT 256. I wanted to add a third monitor, so I bought another 17-inch and then picked up a GeForce MX4000 128MB PCI. When I started my computer, my GeForce 6800 was in 8-bit color mode. I checked my Device Manager and it said my 6800 was disabled because no system resources were available. I disabled the MX 4000, but there was no change. Does the nVidia driver allow just one videocard at a time? I have an Abit IC7-G mobo, 1GB RAM, and a P4 3.2GHz with an 800MHz frontside bus.

—RUSS MILLER

You've discovered the problem with multiple-monitor support in Windows today—it's spotty at best. In our experience with tri-monitor rigs, each install goes differently, so you need to be willing to experiment. Assuming you're running Windows XP (earlier versions of Windows had even worse multi-mon support), you should be able to get it working with minimal fuss. First, make sure both of your videocards use the same driver—your two nVidia-powered cards do for sure.

Next, get the AGP card—usually a dual-head card—working with two monitors. This is usually just a matter of plugging in both displays and enabling the second monitor on the Settings tabs of the Display control panel. Once you have the AGP card working, install the PCI card, and then try to get it operating properly.

When your second card is installed, you may need to rerun the driver installer program from your GPU manufacturer. Once that's done, reboot, and go into the Device Manager—right-click My Computer and go to Properties, then click the Hardware tab, and click Device Manager. Make sure the drivers for both cards are properly installed. When one card or the other only runs in 8-bit mode, it usually means the drivers aren't properly installed. Once the drivers are properly installed, try to enable all three monitors, and set the proper resolution for each.

If it's still not right, check the "Init Video First" setting in your BIOS. Depending on the videocards and the mobo, you should test both the AGP and the PCI setting. Frequently, when one works, the other won't. Just make sure that one of the displays connected to your AGP card is identified as the primary in Windows XP—you can do that by right-clicking the display in the Display control panel's Settings tab, and selecting Primary. Direct3D content will only appear on the primary display.

SPACING OUT

When my friend built my PC, he made a 5GB partition for Windows XP, and a second partition with the rest of the drive space. Problem is, when I try to download Windows updates, it says there isn't enough space available! Is there a way to make that 5GB partition bigger? I have approximately 190GB left to play with on the rest of the hard drive.

—ERIC

The easiest way to increase the size of a partition is with a utility like *Partition Magic* (www.powerquest.com/partitionmagic). What makes *Partition Magic* cool is its near-magical ability to resize your partitions on the fly, without having to back up your data, erase the drive, and recreate the partitions. What's better, *Partition Magic's* handy wizards will walk you through the entire process!

If you don't want to shell out money for a special program, the alternative is to back up all your data, wipe the drive clean, and then reinstall Windows and all your software. We think it's worth the $60 bucks to save all that time. ■

MP3 ID3 ASAP

Is there a program that can automatically correct wrong/missing information in MP3 ID3 tags? I have approximately 4,300 MP3s and am considering purchasing an iPod. Before I do, however, I would like the ID3 tags to display the correct information. Obviously, with so many MP3s, this would not be feasible to do manually.

—JUSTIN BROWN

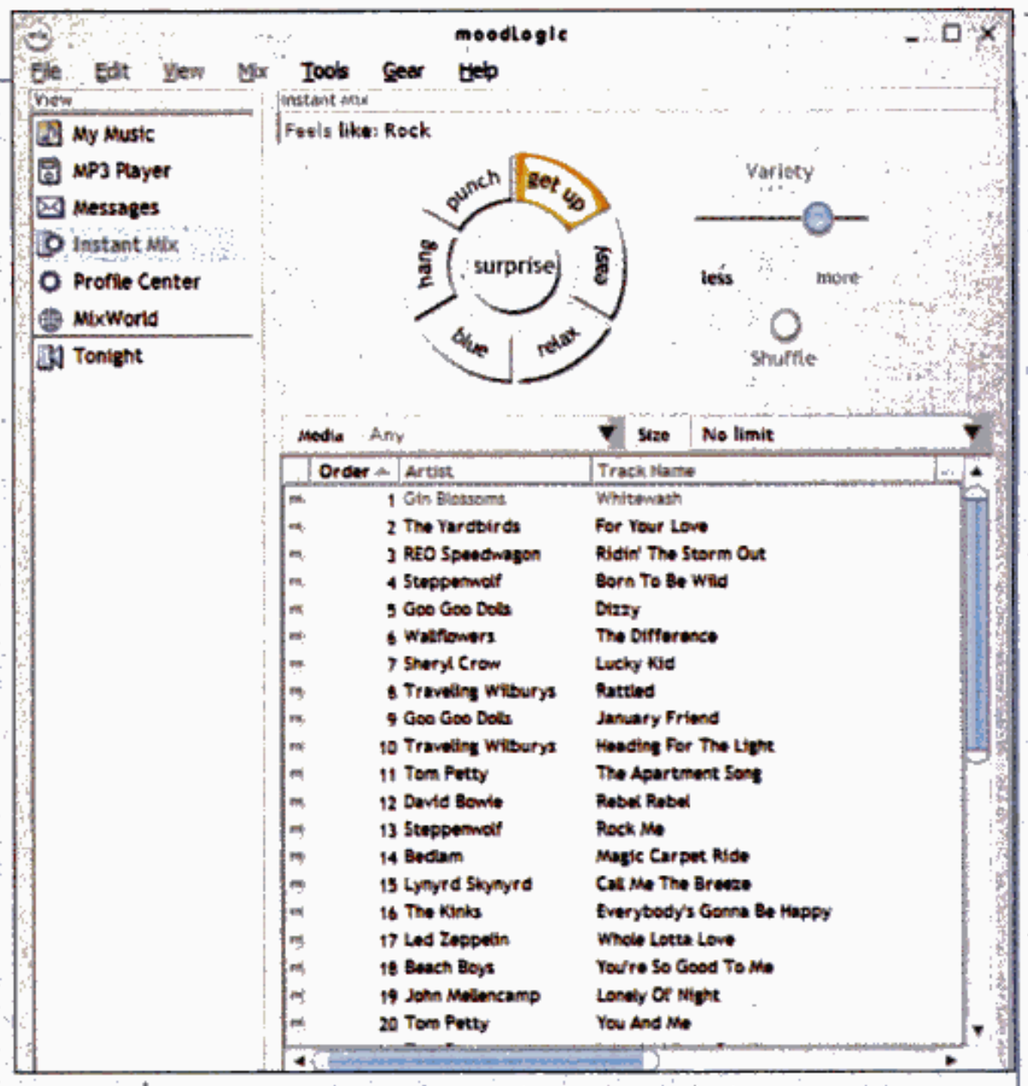
There are a number of ways to rehabilitate your ID3 tags, but no single one is likely to help for more than 60 or 70 percent of your tracks.

Your first plan of attack should be an automated ID3 tag editing utility. One of the Doctor's favorite such programs is *Tag&Rename* ($30, www.softpointer.com/tr.htm). It can convert among various tag formats, dig up tag data from freedb servers, and best of all, it supports a ridiculous number of formats, including protected iTunes (M4A) tracks, and lossless formats like FLAC and Windows Media Lossless. That's crazy! There are many freeware ID3 tag editing utilities that you'll be able to find through Google, but none are as comprehensive as *Tag&Rename*.

Another approach is an automated tagging application like *MoodLogic* ($40 for 10,000 tracks, (www.moodlogic.com). *MoodLogic* will sample the tracks on your hard drive via your net connection, and compare the sample against its own database. When a match is found, it updates your MP3s with the ID3 tag information it has on file.

No matter what you do, you're going to have orphaned MP3 files. These you can move into a separate folder for manual tagging later. If your music library is a complete disaster, filled with incorrectly labeled tracks downloaded from file-sharing services, you may want to consider creating a new music library, filling it with new rips of your music with accurate tags, and slowly folding in tracks from your old collection as you listen to them and manually update their ID3 tags.

Obviously, once you have your tags straightened out, you should make a commitment to only importing tracks that have accurate ID3 tags into your music library .



***MoodLogic* will compare your MP3 files to a database of song signatures and correct your ID3 tags when there are problems. But it's not perfect, especially if you have a large number of mistagged MP3s.**

Just as the female praying mantis can't help but feast on the body of its mate, the Doctor is compelled to lord over ailing PCs—in a good way. If your computer is misbehaving, acting up, or generally out of whack, send an e-mail to **doctor@maximumpc.com** and the Doc will do all he can to fix your computing problems.

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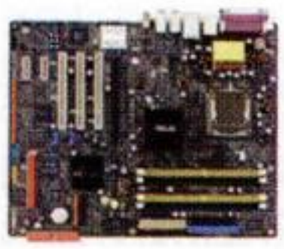

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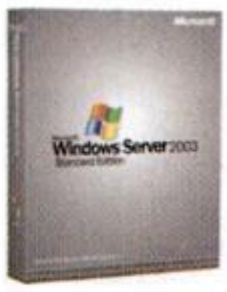

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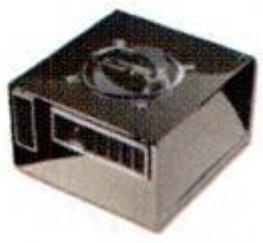

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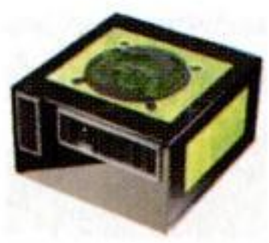

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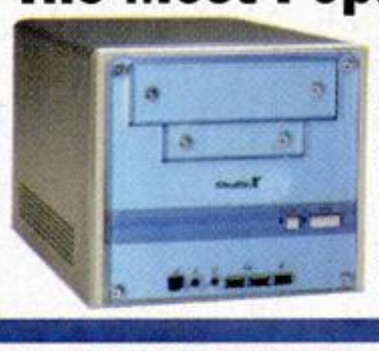

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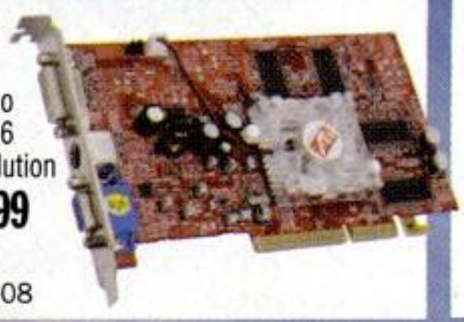

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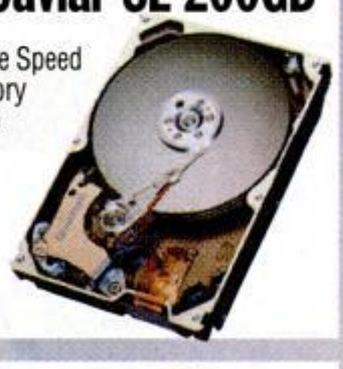

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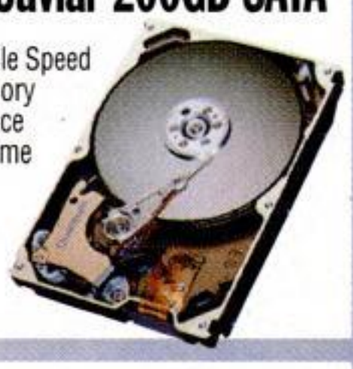

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How To...

A step-by-step guide to tweaking your PC Experience

SHOOT AND SCORE

Take better photos, fix the flaws, and get perfect prints

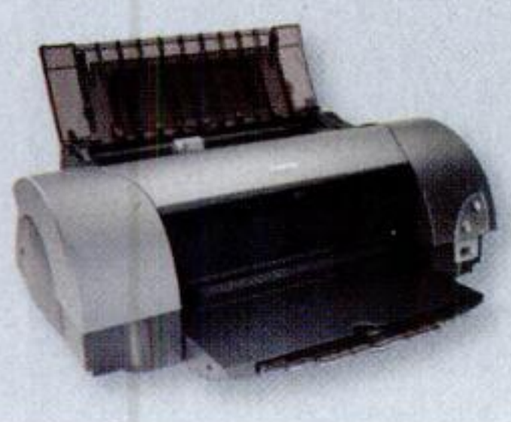
BY KRIS FONG

Whether you just got your first digital camera or you're looking to build on your picture-taking skills, you've come to the right place. Any bozo can take OK shots with most point-and-shoot digicams, but with a little extra know-how, your digital pictures can look incredible!

Sure, cameras have plenty of autopilot controls that'll do the dirty work for you, but they won't always give you the results you're after. You'll get better, more compelling pictures if you exercise some control over the exposure, shutter speed, and focus settings. To help you get the most out of your investment, we'll show you how to work your camera's controls to capture great images, fix problems and enhance details in an image editor, and optimize your pics for print.

WHAT YOU'LL NEED

- Any digital camera with manual controls, such as the Kodak DX6490 pictured above
- A computer with a USB port
- Image editing software such as Adobe *Photoshop Elements* ($100, **www.adobe.com**), *LView Pro* ($40, **www.lview.com**), or *Pixia* (free, **http://park18.wakwak.com/~pixia**)
- A color printer, such as the Canon i9900 pictured here



Shoot better images

Before we can show you how to touch up your pics, you need to get familiar with how pictures are made. For a camera to create an *exposure*—an even balance of highlights and shadows—light from a subject enters the camera, exposes the image sensor, and becomes digitized. Your camera has two controls—the aperture and shutter—that can be automated or manually controlled to regulate the amount of light that enters the lens.

The aperture is a hole surrounded by thin blades that can be widened (to let in more light) or narrowed (to let in less light). It functions like your eye's iris and pupil. The shutter functions like a gate, controlling how long the image sensor is exposed—think of it as the eyelid.

USING THE APERTURE

1) CONSIDER YOUR COMPOSITION

Aperture size, measured in *f-stops* (the larger the number, the narrower the size) affects the focal range within an image, and can help you capture compelling portraits and still lifes.

A wide aperture (such as f-2.8) creates a narrow *depth of field*—the range in which all objects appear to be in sharp focus—to capture a sharply focused subject while blurring its foreground and background. A narrow aperture (such as f-16) creates a wider depth of field to capture a larger range of objects in sharp focus. Depth of field capabilities vary—SLRs generally offer a greater range than cameras with built-in lenses.

One of the great things about a digital camera is it doesn't cost anything to experiment! To explore your camera's

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(continued from previous page)

abilities, grab some small objects (like gummy bears or green army men) and place them in a 1- to 2-foot area on a well-lit tabletop, and try capturing your subjects using different settings. Be as creative, messy, or creatively messy as you want—it's your picture.

Place several objects at different distances from the camera, so you can see how your camera's aperture setting affects the depth of field.

2) GO WIDE FOR NARROW FOCUS

To isolate one object from many, set a wide aperture. Objects that are some distance in front of and behind your focal point should appear slightly blurred—again, depending on the lens in your camera, your mileage may vary.

Set your camera to Aperture Priority (flip the dial to A or Av). In this mode, the camera automatically sets a compatible shutter speed for your aperture and subject. Get up close to your composition and angle the camera so you're capturing a range of objects in your frame. Then set your camera to its widest aperture (the smallest number available, such as f-2.4—view this in the viewfinder or LCD). Focus on one object in the center of your frame, press the shutter-release halfway to lock the focus and exposure, and then press down fully to take the picture. (We shot this at f-2.8.)

By opening your aperture all the way, you can create a very narrow depth of field, and focus in on a thin slice of a scene.

3) GO NARROW FOR WIDE FOCUS

To create an image that shows all or most objects in sharp focus, use a narrow aperture. Frame your composition the same as in Step 2 and set your camera's aperture to f-8.0 or higher. Focus on the same center object, press the shutter-release halfway, and then press it fully. (We shot this at f-18.)

To see what changes in the depth of field look like, shoot at a variety of aperture sizes, making sure to frame the composition identically in each snap. When finished, download your pics to your PC and take a look at your images to see how your settings affected the range of focus. Then apply what you learned in your own portraits and still life images.

If you want a greater depth of field, close your aperture as much as possible.

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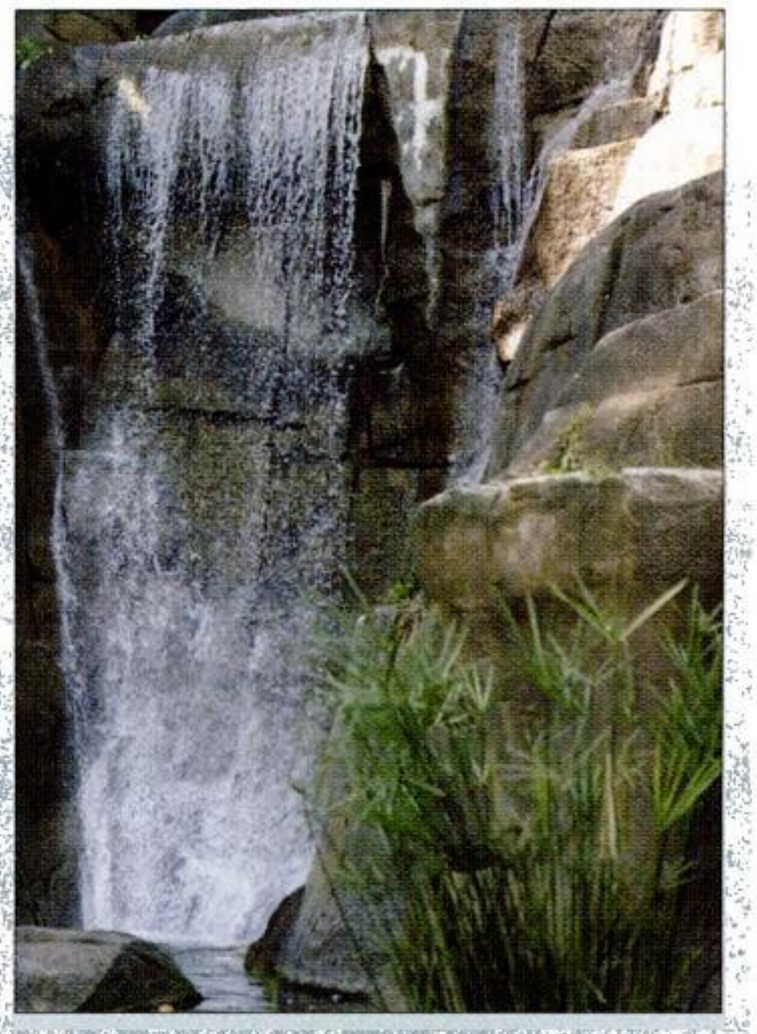
USING THE SHUTTER

1) FREEZE ACTION

If you're shooting moving objects (like Junior riding his new bike), use Shutter Priority to freeze or capture motion. Remember that the shutter speed is the length of time the camera's sensor is exposed to the image you want to capture. Shutter speeds can range from thousandths of a second to many minutes. If you want to freeze action, such as a speeding race car or your pooch snagging a Frisbee mid-air, you must use a really fast shutter speed.

Find a place with moving objects, like a busy street, a basketball game, or a waterfall. Switch your camera to Shutter Priority (S or Tv)—your camera will automatically set a compatible aperture for your shutter speed and composition—and compose your shot. Set a fast enough shutter to freeze your subject's motion: If you're shooting cars, try 1/200 of a second; if you're shooting guys shooting hoops, try 1/125. Then shoot and review your image. If the subject's blurry, set a faster shutter. If the subject is frozen but the image is underexposed (dark), set a slower shutter that's fast enough to freeze the action. This 1/500-second shutter shot transformed the water flow into droplets.

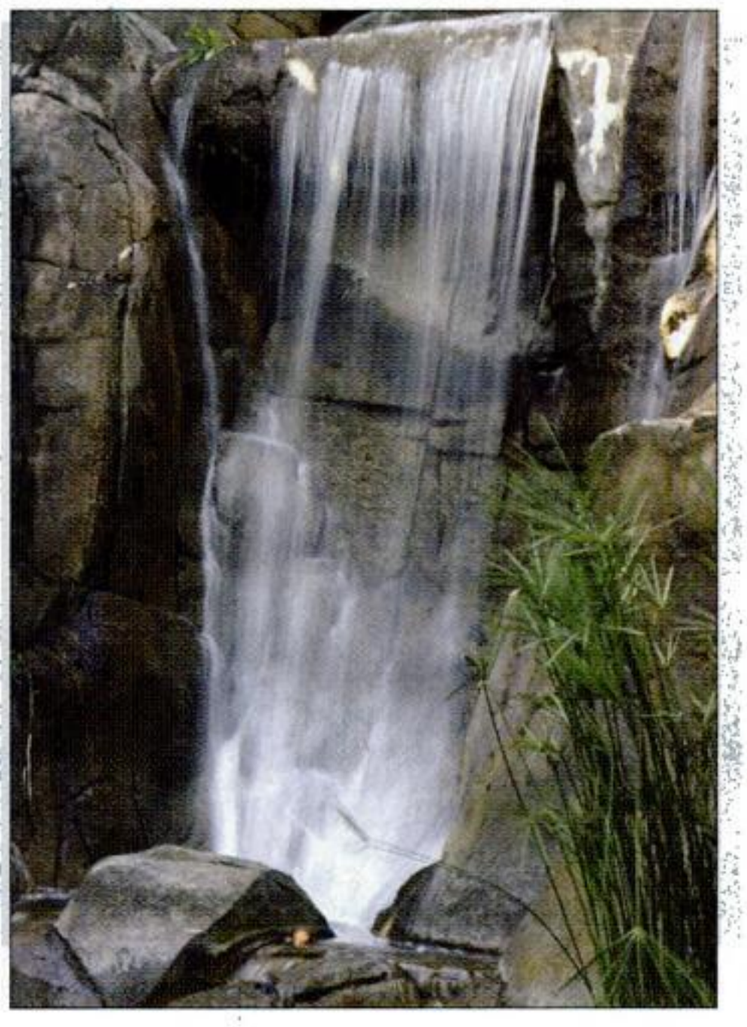


A fast shutter speed can freeze even the fastest moving object in flight.

2) CAPTURE MOTION

To add some creativity to objects on the move, use a slow shutter to capture motion. A slow shutter can capture the rush of falling water, the glowing trails of car headlights at night, or the dizziness of a merry-go-round. It'll also capture camera shake if you're hand-holding the camera, so use a tripod if you've got one (or cut back on the caffeine).

Find another moving subject (or chill with the one you froze above), compose your shot, and set a slow shutter for your object's movement. If you're shooting cars at night, try 1 second or longer; if you're shooting a merry-go-round, try 1/20 of a second. Then shoot and review. If you have too much movement, set a faster shutter. Not enough? Set something slower. We used a 4/10 of a second shutter to capture this.



Using a low shutter speed lets you add motion blur to your shots. Anything slower than 1/60 can result in blurry images, especially if you don't use a tripod.

GETTING THE RIGHT EXPOSURE

1) ENLIST EXPOSURE COMPENSATION

Sometimes your camera doesn't cut it. Your snowboarding shots came out dark, while your calla lily portrait was overexposed. It may be time to enlist the Exposure Compensation (the +/- button). This control lets you tell your camera you want a different exposure than what it's currently providing.

Most cameras have an exposure value (EV) range of -2 to +2, typically divided into 1/3-step increments (you should see a number in the viewfinder or on the LCD). Zero (0) means no compensation. If your pics are too dark, boost the EV number up a step or two, and take test shots until you get what you want. If your images are too light, lower the EV number a step or two until you're satisfied.

To compensate for an overexposed image—notice how the wood grain in the left image is blown out—we lowered the exposure a whole step.

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2) GO FULL MANUAL

Exposure Compensation can only go so far—for everything else, there's Manual. This mode lets you fully control the aperture and exposure, allowing you to work around troublesome lighting or tweak it to your creative whim (like we did in our example). To show you how it works, let's play with underexposure.

Instead of heading blindly into Manual mode, use the two-step approach, which helps you get compatible aperture and shutter settings. Find something to shoot. Then switch your camera to Aperture Priority, set an aperture, make note of the shutter speed that your camera sets, and shoot a reference shot. To underexpose the image, switch the dial to M, set a faster shutter speed than what the camera set before, and shoot again. Experiment with different settings—both faster and slower speeds to see how they affect the exposure. Likewise, shoot in Shutter Priority, gauge the camera's auto aperture, and then flip to Manual and vary the aperture size to lighten or darken an exposure.

Manual mode lets you create some nifty effects—like this halo—that the auto modes would never let fly.

3) BOOST THE ISO

Shooting in low light is a whole other beast. While flash helps shed light on shady subjects, it also obliterates environmental lighting, like in a nightclub or on the Vegas strip. If you want to capture the atmosphere, boost the camera's ISO setting. This is also a great way to avoid camera shake.

ISO controls the image sensor's sensitivity—the higher the number, the less time required to get adequate light exposure, meaning the shutter can snap closed faster to help freeze action. Point-and-shoot cameras typically produce more image noise, or grainy texture, at higher ISOs than SLRs, so beware.

Find a dark place with interesting lights and locate a moving subject. Boost your camera's ISO up to 400 or higher and try to freeze the motion in your shot. If your shot is really blurry, set a higher ISO. Experiment with different ISO and Exposure Compensation settings until you get a good compromise of exposure and sharpness without too much noise.

You can manually tweak your image sensor's sensitivity for better results in low-light situations.

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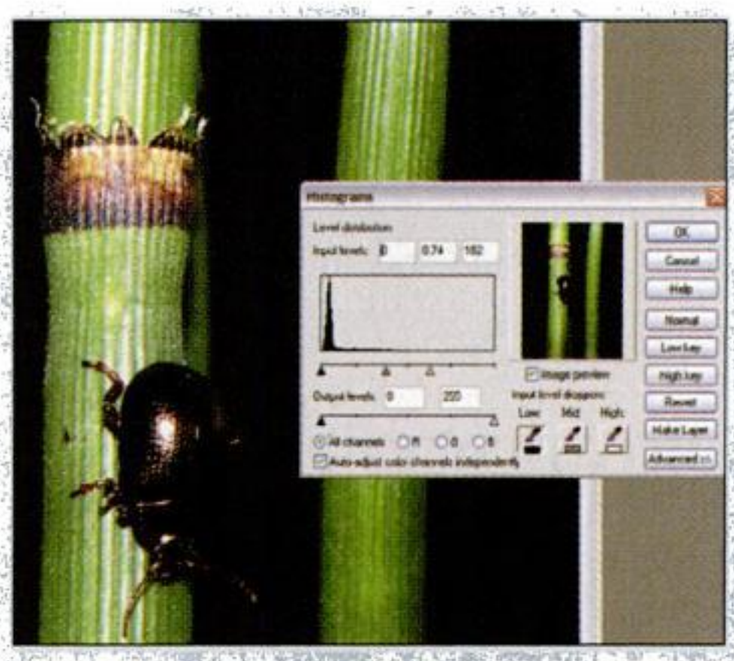
CORRECT YOUR PHOTOS

No matter how kick-ass a photographer you are, your photos can benefit from a little photo fix. Whether your images need major resuscitation or just a light sprucing, there are plenty of image editors that get the job done. Here, we show you some quick fixes to common problems, using *LView Pro 2004,* a great (and cheap) all-in-one image processor. Other image editors function similarly, but you may have to dig into the documentation to figure out how a specific feature works if you use another app. Note: Before you start editing your photos, create a copy on which you can practice your touchups. You don't want to jeopardize the original.

1) BRIGHTEN EXPOSURE

One of the most common digital camera problems is underexposure. Underexposure happens when the camera's sensor doesn't detect enough light from some or all of the subject. Luckily, you can easily fix it. In *LView*, select Color > Histograms. In the resulting window, your image's tonal range is represented as a mountain-like graph known as a histogram; black image data (shadows, dark colors) takes up the left region, gray data (shrubs, brick) resides in the middle region, while white data (white clouds, light colors) sits on the right side.

To fix your exposure, check the Image Preview box and then move the white data slider (the white triangle) to the left to brighten the highlights to your liking. Move the gray slider left to brighten the midrange, or right to darken it. When you're satisfied, click OK. (In the sample image at the right, we brightened the highlights and then darkened the midrange a bit to punch up our picture of the bamboo stalks.)

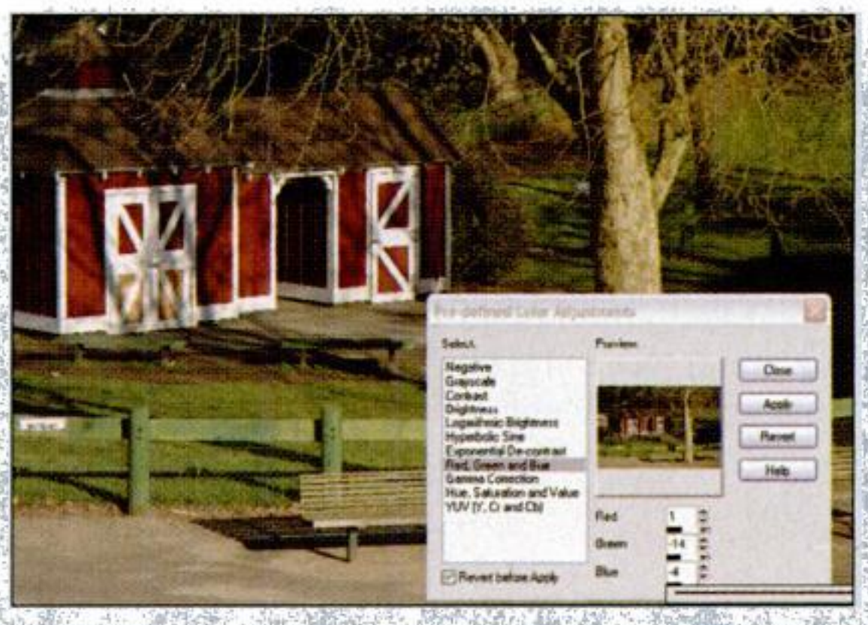


Fixing underexposed images is simple using *LView's* Histogram tool.

2) FIX FUNKY COLOR

To fix an off-color image, select Color > Adjustments. In the resulting window, select Red, Green, and Blue to display the RGB slider controls. Which slider or sliders you use depends on what colors you're trying to alter. The Red slider alters cyan (move left) and red (move right), the Green slider alters magenta (move left) and green (move right), and the Blue slider alters yellow (move left) and blue (move right).

To fix, say, a green-tinged image (like our example), click the Green slider button to display the slider and move the nubbin left until things look better in the Preview window. Click Apply to view the change on your real image. Continue in this manner with other sliders (if needed). To fine-tune changes, use any color's up or down arrow buttons. Once your color looks right, click Close.



It doesn't happen often, but if you accidentally shoot an off-color image, you can easily fix it by toning down the offending colors manually.

3) SHARPEN THE FUZZ

All images benefit from a little sharpening. You can greatly improve fuzzy images and boost the detail in images you're already satisfied with. To sharpen blurry images, select Color > Filters to open the Image Filters window.

If your image looks pretty good, select Sharpen for basic, light sharpening, and click Apply. If an image is slightly blurry, select Sharpen More, and click Apply. If your image is more than a little blurry, select Edge Enhance; if it's extremely blurry, select Edge Enhance More—or bail on the mess and call it art. Then click Close.

Sometimes fuzzy images are a good thing, but most images can use a little sharpening. To fix up blurry images, use the Sharpen filter.

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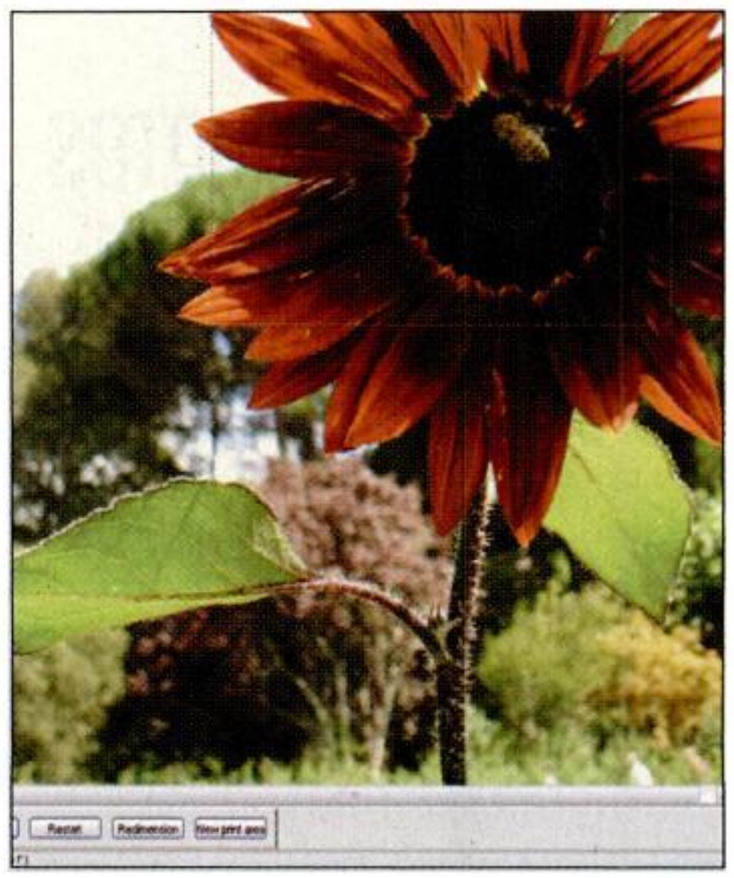
4) BRIGHTEN EXPOSURE

If you want to remove unwanted perimeter obstructions or reframe your composition, use the crop feature. You can also use the feature to fake a longer zoom on an otherwise faraway subject if you've got a very high-resolution image.

To crop an image, select the Simple Crop tool and draw a marquee around the area you wish to keep. Resize and move the box as needed, and then click Crop Now! at the bottom of the screen.

Keep in mind that you can crop out as much as 75-percent of a 3-megapixel image and still print a photo-quality 4x 6-inch print, while a 6-megapixel image will yield a 5x7 with the same amount of cropping.



Depending on the resolution of the original image, you may be able to crop in on the subject of your photo to create a more dramatic picture.

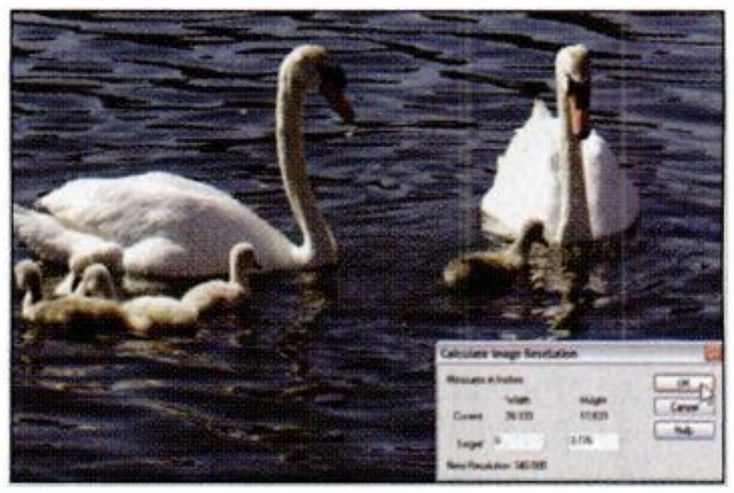
PRINT PERFECT PICS

Printing pics may seem simple enough—heck, you just press Control-P, right? And then you blame the crappy results on the printer. No more excuses. Here's how to get perfect prints every time.

1) RESIZE YOUR IMAGE

Unless you're shooting with a high-megapixel camera, your images most likely have a default 72ppi (pixels per inch) resolution—far from photo quality when printed. To get photo quality, your image needs at least a 200ppi resolution.

To change the resolution and resize your image for the paper at hand, select Image > Resolution to open a window. Click "Calculate for Physical Dimensions" to open another window. Then type a new width or height number in the respective field that corresponds with your paper—the opposite dimension and resolution will change accordingly to keep the proportions. Click OK in both windows to close them.



To print a photo quality image, a printer must be fed a 200ppi or greater source image! If you want your pics to look their best, you need to up the resolution yourself!

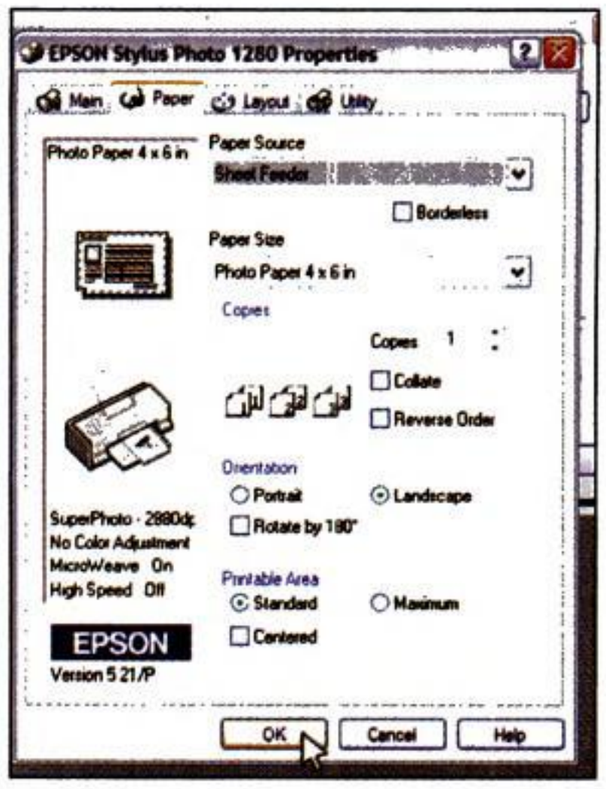
2) COMMAND THE HIGHEST RESOLUTION

Select File > Print (or Control-P) and in the resulting Print window, click Properties to open your printer driver dialog. Printer dialogs vary—we're using an Epson; if you're using something else, apply our instructions to your printer. Click the Main tab and choose your paper type from the Media Type list—be sure to use high-quality photo paper, preferably from the same manufacturer as your printer. Under Ink, choose Color. Under Mode, choose Custom, and then click Advanced. In the resulting window, select your printer's highest resolution from the Print Quality drop-down menu. If you're using an Epson, choose No Color Adjustment under Color Management. Then click OK.

Using your printer's highest resolution may take slightly more ink, but your images will be indistinguishable from photomat prints.

3) ALERT THE MEDIA

Click the Paper tab and select your paper size from the Paper Size drop-down menu. Under Orientation, choose Portrait (for a vertically-oriented image) or Landscape (for a horizontal one). Most photo printers vary the amount of ink used on normal paper and photo stock. Once you've done that, click OK to close the printer dialog, and then click OK in the Print window to print. ■



We're on the home stretch now! Make sure you choose the proper paper size and type before you press OK on that final print dialog.

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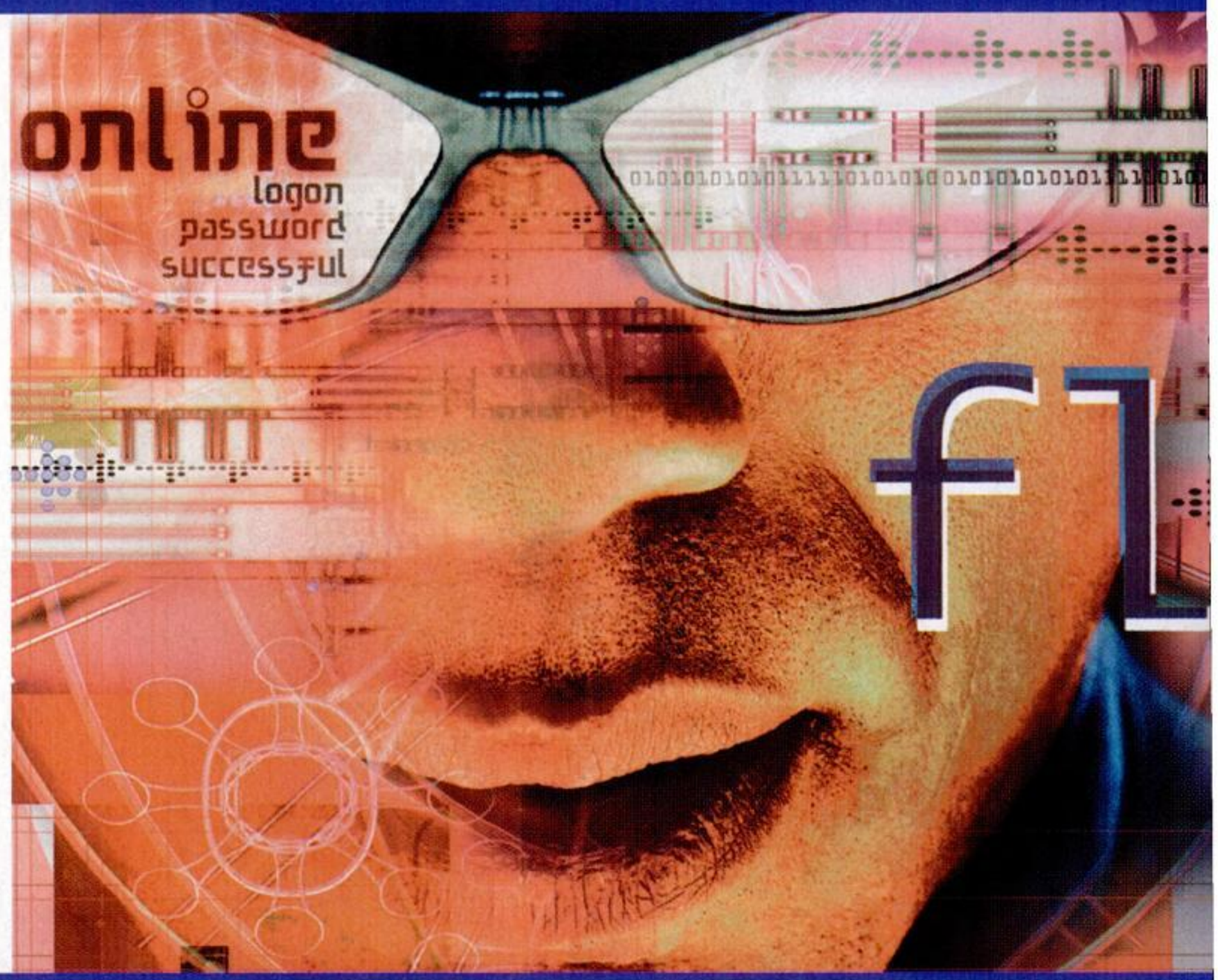

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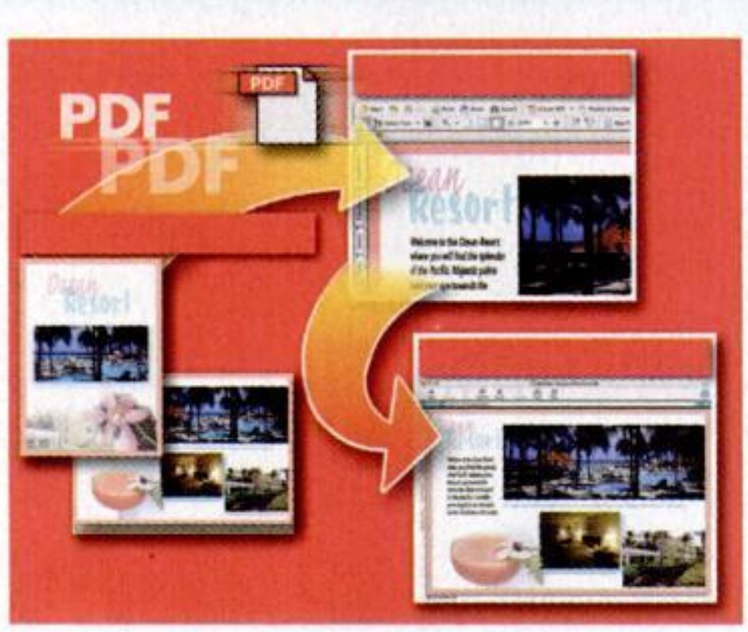

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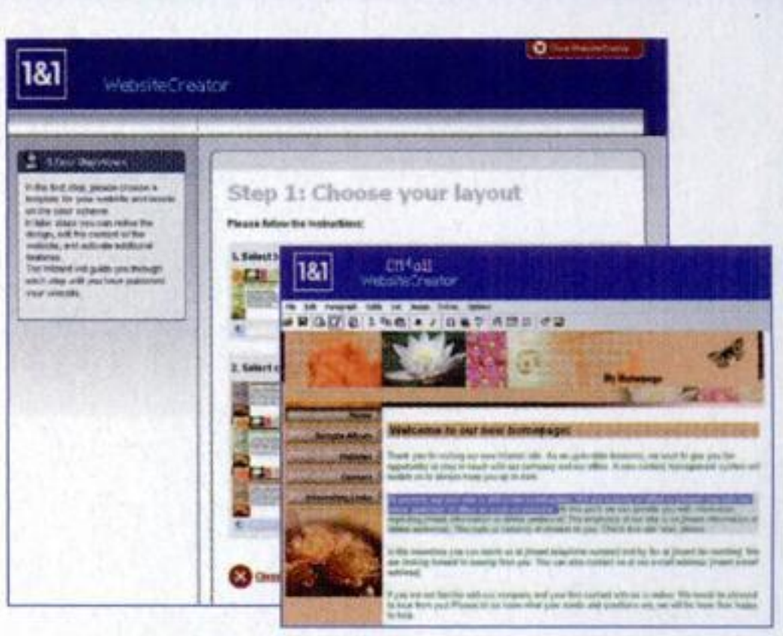

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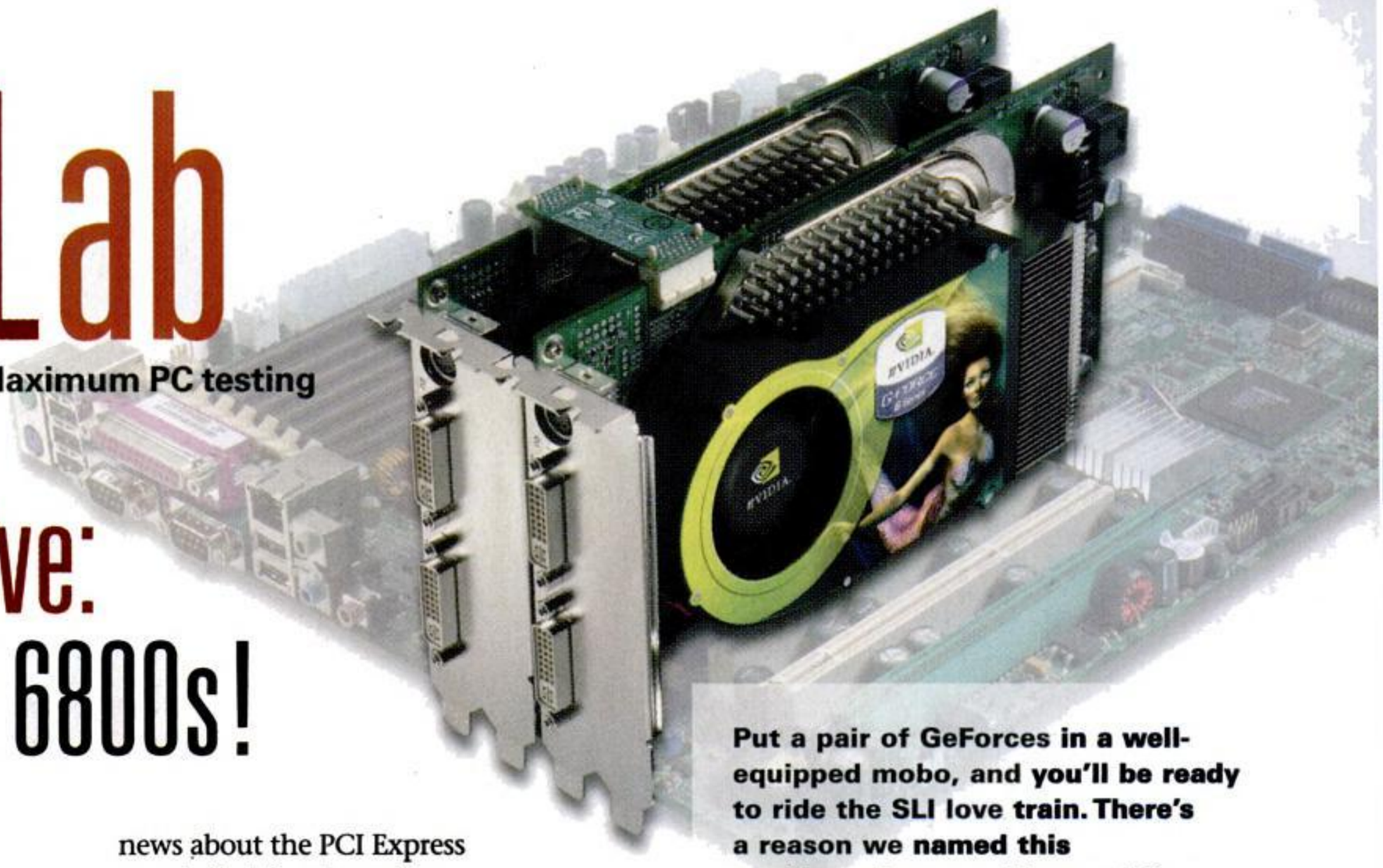
In the Lab

A behind-the-scenes look at Maximum PC testing

World Exclusive: Dual GeForce 6800s!



Put a pair of GeForces in a well-equipped mobo, and you'll be ready to ride the SLI love train. There's a reason we named this configuration our videocard Gear Of The Year winner, and that reason is speed.

Is nVidia's hyper-expensive dual-card rig worth the cost? After testing the first SLI-equipped reference system, the Maximum PC Lab answers the question with a resounding *"YES!"*

Back when 3D acceleration was young and Bill Gates' net worth was still less than $100 billion, a little company named 3dfx released a videocard called the Voodoo2. Although ludicrously slow by today's standards, the Voodoo2 was terrifically fast for its time, but its incredible speed was only half of what made it special. In one of the first consumer-level uses of SLI (**scan-line interleave**) technology, intrepid gamers could pair two Voodoo2 cards together and gain close to a 100 percent increase in performance.

Unfortunately for gamers, the PCI slot—which simply couldn't provide enough bandwidth to satisfy the increasing demand for larger textures and more complex models—was phased out for graphics soon after the Voodoo2 release. Its replacement, the AGP bus, allowed for only a single AGP slot per system, effectively putting the kibosh on multi-card setups. Buh-bye, SLI.

Fast forward eight years. The AGP bus is rapidly approaching its own ceiling. Its replacement, the shiny, new PCI Express bus, boasts higher transfer speeds and fully bi-directional transfers. But the really big news about the PCI Express spec is that it restores the option of connecting more than one videocard to suitably equipped PCs.

In our September issue, we reported that nVidia was preparing a new dual-card approach to 3D video, and promised hard Lab results to come. Well, folks, it's time—we recently received the very first SLI-equipped (SLI is now marketese for **scalable link interface**) reference system, and we've taken it into the Lab for a series of brutal hands-on tests that only *Maximum PC* can deliver.

Stunning Performance

The machine we used to test nVidia's SLI solution is a 3.4GHz Xeon on an Intel E7525 chipset with 1GB of registered DDR memory. The nVidia solution differs from Alienware's yet-to-be-released dual-card config (reported on in the June 2004 issue) in one important way. Instead of rendering half of the screen with each card, then using an external device to combine the two half screens, the nVidia boards communicate directly with each other using a special internal SLI connector. This high-bandwidth link between the two boards allows them to share their onboard memory and communicate faster than they could even over the PCI Express bus. At press time, we had yet to test the Alienware solution, but our hunch is that nVidia's interconnect makes for more efficient rendering and faster performance. (By contrast, Alienware's tech allows you to plug in either ATI or nVidia cards—although not at the same time.)

The Maximum PC Lab can be a pretty pragmatic place, but the performance gains we saw stunned us into the sort of euphoric numbness we rarely experience. The SLI configuration nearly doubled the results of an otherwise identical single-card rig in most of the benchmarks we ran. But wait, it gets better: We knocked out an astounding 63.6fps(!) in *Doom 3* at 1600x1200 with 4x AA and 8x anisotropic filtering enabled, and a whopping 20,007 score in *3DMark 2003*. Holy. Cow.

There's a catch, though. In order to see performance gains—even in graphics-intensive games like *Doom 3*—you have to really crank up your resolution and anti-aliasing settings. Even at 1280x1024 on our test machine, *Doom 3* was constrained by the performance of the CPU. It wasn't until we upped the resolution to 1600x1200

WHAT ABOUT MULTIPLE MONITORS?

Once we satisfied our questions about performance, we eagerly set out to learn whether we could set up a four-monitor configuration by connecting the displays to the two nVidia cards' dual-outputs. Multi-mon aficionados will be glad to know that nVidia's SLI solution works splendidly. We plugged in the four monitors, rebooted the machine, and were up and running with a panoramic four-head display that didn't exhibit any of the 2D performance woes that multi-mon displays typically exhibit when multiple PCI cards are involved.

The new 2005 edition of *3DMark* brings mortal systems to their knees, but our SLI rig churned through the benchmark without incident and reported the highest scores we've seen to date.

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Wonder how much work each card in your SLI rig is doing? Flip an option in the control panel, and you can see for yourself.

and cranked up the antialiasing and anisotropic filtering settings that we saw any difference between single-card and dual-card setups.

How Can I Upgrade to SLI?

Achieving these impressive performance gains requires a pretty substantial commitment up front. First, you need a motherboard with two physical x16 PCI Express slots in the proper configuration—two slots apart. The system we tested used a Xeon with an Intel E7525 chipset, but we don't expect to see many gaming rigs built with this hardware.

A more likely base for this configuration is nVidia's new nForce4 chipset (profiled on page 14), which has been designed from the ground up to support SLI and doesn't require a massive dual-CPU motherboard or pokey registered DDR memory. While it wasn't ready for testing as we went to press, we should have a full hands-on test in the January issue.

Even with nForce4, you'll need a beefy power supply to deliver juice to not one, but two videocards, as well as a case that can keep both videocards cool.

Fortunately, you aren't forced to use mega-expensive GeForce 6800 Ultras. Many nVidia PCI Express videocard models, from the GeForce 6600 on up, will include the SLI connector.

If that sounds like a lot of money, consider this: If you go with nVidia's new SLI approach, you will attain unprecedented levels of 3D and gaming performance.

BENCHMARKING DUAL CARD SLI: The Numbers Don't Lie

	SINGLE CARD	DUAL CARD
3DMark 2005 Overall	5051	**7741**
3DMark 2003 Overall	12223	**20007**
3DMark 2003 Game 2 (fps)	97.9	**177.2**
3DMark 2003 Game 4 (fps)	70.3	**119.5**
Doom 3: 1600x1200, 4xAA, 8x aniso (fps)	38.7	**63.6**
Far Cry: 1600x1200, 4xAA, 8x aniso (fps)	32.3	**44.8**
CS Source: 1600x1200, 6xAA, 8x aniso (fps)	104.4	**116.8**
Halo: 1600x1200 (fps)	73.6	**84.4**

Best scores are bolded. All tests were run on a Xeon 3.4GHz machine in a SuperMicro X6DA8 with 1GB of registered DDR memory. 3DMark 2003 and 3DMark 2005 were run at their default settings, all other benchmarks were run at the settings listed above. Did you know that the wildebeest is a type of antelope?

WHERE'S BEST OF THE BEST?

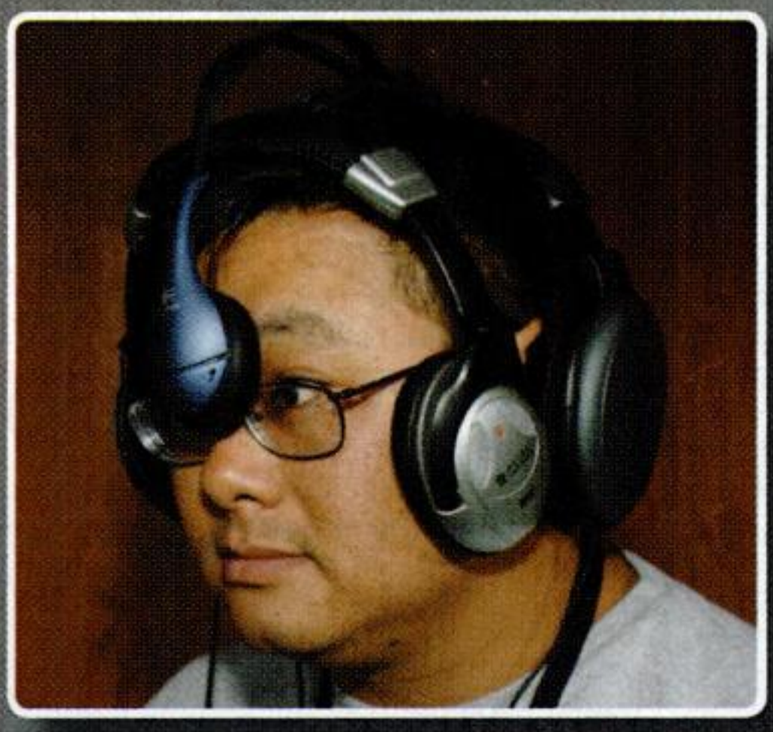
Because our Gear of the Year cover story (page 30) recounts the best components in each PC category, our Best of the Best section is taking a one-month hiatus. It will return next month. If you'd like to see last month's selections, head over to **www.maximumpc.com** and click "Product Rankings" in the left-hand navigation bar. Giddy up!

Patent Office, Part Deux

Following the wild commercial and critical success of CaseFrodz™—the original faux-PC case window—the Maximum PC Skunkworks team has had more work than they can handle. But look what happened when we left it to the interns to come up with new innovative hardware hacks.

At first glance, the ATX/BTX conversion kit seems like a grand idea. The kit quickly converts any ATX tower case into a BTX case in one simple step. Unfortunately, that simple step was "Turn your ATX case upside down!"

Want an easy way to convert your single-layer DVD+/-R discs into double-layer media? Who wouldn't! But stapling two optical discs together just ain't gonna cut it. Sorry guys.



Our final intern submission was 5.1 headphones that reportedly "really work." Still, we had no choice but to ditch the idea when our legal department listed "birth control" as a secondary usage.

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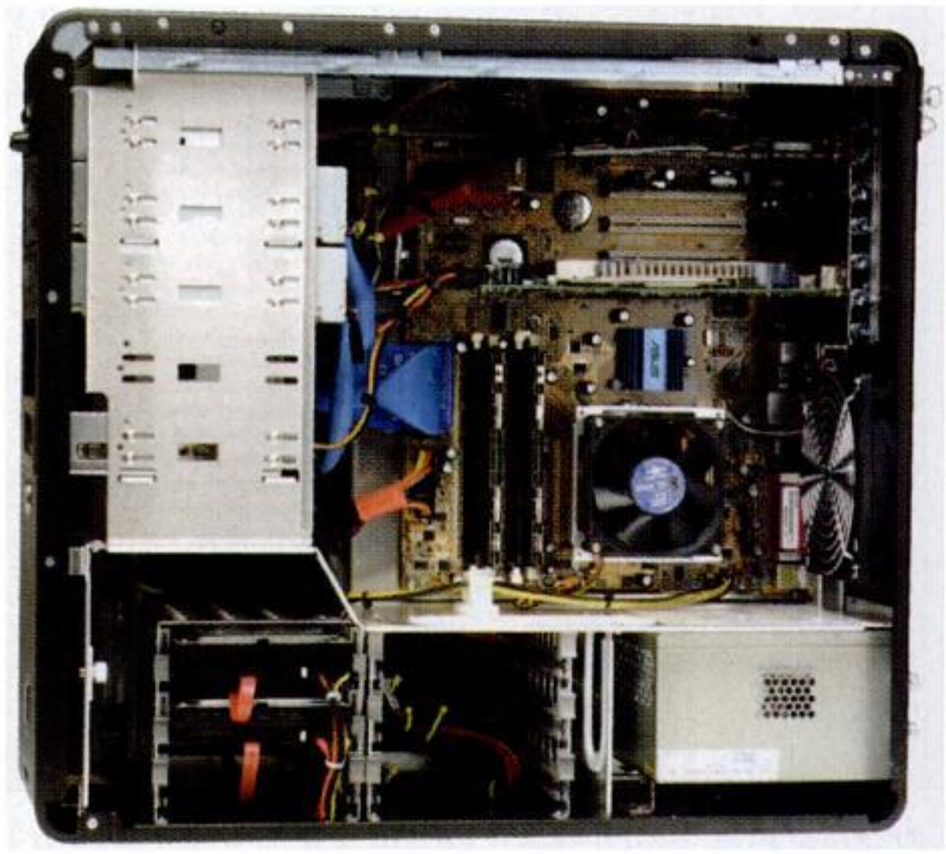
Digital Storm Twister

Sure it's fast, but "fast" just barely meets our expectations



The Twister pushes all the right buttons but failed to knock us to the floor. Call us jaded, but it takes more than an Athlon FX-53 to wow us these days.

Tornados are measured by the amount of damage they do on the Fujita scale. An "F5" moves houses off foundations while an "F0" breaks a couple of branches. With this in mind, Digital Storm's Twister would probably rate an "F2." It blew into our Lab, overturned a few clipboards, but ultimately failed to knock us off our stools. Although fast, the Twister's main weakness is its lack of surprising and innovative parts.

Call us jaded, but we generally expect to see new PCs equipped with new hardware when its available. For example, the ZT Group system (reviewed on page 82) sported a shiny new 3.46GHz Pentium 4 operating on the 1066MHz bus. It certainly doesn't help a vendor's case when our Lab has new hardware that they don't. For instance, we have AMD's newest Socket 939 Athlon 64 FX-55, but Digital Storm could only muster the last-generation Athlon 64 FX-53 in this rig.

Despite our disappointment, we still found the Twister to be a solid-performing rig. This was our second encounter with the Lian Li PC-V1000 case, and it continues to grow on us. Some folks may find the Apple G5 look distasteful, but we think its inverted-ATX design, dual 120mm fans, and well-thought-out interior make it a mighty nice homestead for hardware. Plus, in black, it looks much less like an Apple knock-off.

The Twister's foundation is an MSI K8T800 A8V Deluxe mobo outfitted with a pair of OCZ DDR400 DIMMs and an GeForce-based Asus V9999 Ultra Deluxe. Don't confuse this with Asus' V9999 Gamers Edition—a 12-pipe card. The Ultra Deluxe is a full 16-pipe part that has ripped up the competition in our Lab tests.

Storage is handled by RAID 0 Western Digital Raptors and a pair of DVD drives, one of which is a Lite-On double-layer, dual-format jobbie. There's also an Audigy 2 ZS and Antec 550 watt power supply. The wiring job, while not in the elite class of Voodoo, is square. Compare the internal shot of the Digital Storm with the ZT Group on page 86 and it's instantly apparent why system builders should take the time to get the wiring right.

Unfortunately for the Twister, it committed an egregious early foul upon boot. Our first attempt elicited two error messages; one saying the kernel database was locked, and another message indicating that the kernel mode driver couldn't be loaded. We decided to run our benchmarks despite the error messages and fortunately didn't hit any snags. Eventually, we disabled a soundcard applet and the messages went away, but consumers shouldn't be forced to do this with a new machine.

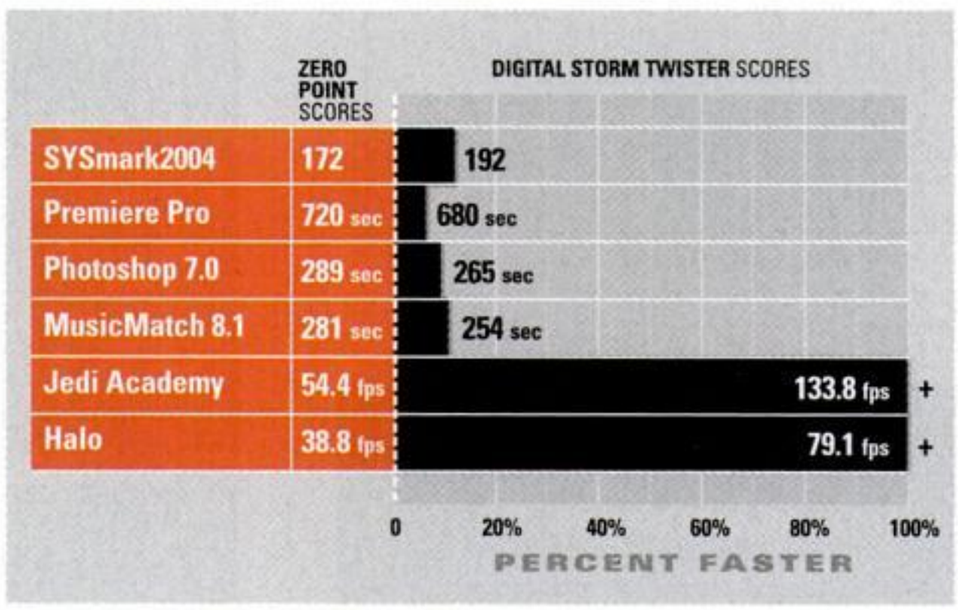
In the end, Digital Storm's impressive performance—thanks to the Athlon 64 FX-53 and GeForce 6800 Ultra—pulled its bacon out of the deep fryer. While the box didn't break any records in *SYSmark2004* or *Premiere Pro* (the P4 architecture dominates both tests), it did manage to kick out a new record in *Jedi Academy* with its 133fps score. The Twister also turned in an exceptional score in *Halo*, where it just trailed the P4 Prescott rigs we've tested. The system even did well in *Photoshop*, tailing the ZT Group by just five seconds. That's pretty good when you consider that the ZT Group PC packs the new 3.46GHz P4 Extreme Edition.

We're dinging the Twister for the two error messages, but overall Digital Storm's PC is a solid initial offering.

—GORDON MAH UNG

UNDER THE HOOD

THE BRAINS	
CPU	AMD Athlon 64 FX-53 (2.4GHz)
Mobo	Asus A8V Deluxe (VIA K8T800 chipset)
RAM	1GB DDR400 OCZ (two 512MB sticks)
I/O ports	Four High-Speed USB, two six-pin FireWire A, one serial, one parallel, optical/RCA SPDIF
LAN	Marvell Yukon Gigabit Ethernet (integrated)
Modem	Creative Model Blaster Value
DISPLAY	
Videocard	ASUS V9999UL Ultra Deluxe (400MHz core / 550MHz RAM)
STORAGE	
Hard drives	Two 74GB Western Digital Raptor 740GD running in RAID 0
Optical	Lite-On DVD-RW SOHW-1633S, 2.4x DVD+R DL, 16x DVD+R, 8x DVD-R, 4x DVD+RW/-RW Lite-On JLMS XJ-HD1665 DVD-ROM
AUDIO	
Soundcard	Sound Blaster Audigy 2 ZS Platinum Edition
FINE DETAILS	
Case	Lian Li PC-V1000, Antec True 550 Watt
Fans/extras	Two 120mm case fans, ThermalTake heatsink, and Vantec Stealth fan
Mouse	Logitech MX Mouse
Keyboard	Logitech Elite Keyboard Cordless
BUNDLE	
Windows XP Professional, Cyberlink PowerDVD, Ahead Express, Nero 6	
BOOT: 41 sec.	**DOWN: 8 sec.**



Our zero-point system includes: a 2.2GHz Athlon 64 FX-51, an Asus SK8N motherboard, 1GB of Corsair Registered TwinX DDR400 RAM, an ATI Radeon 9800 XT, a 250GB Western Digital WD2500JB hard drive, Plextor PX-708A DVD burner and a PC Power and Cooling TurboCool 510 Deluxe power supply.

MAXIMUM PC VERDICT 7

HELEN HUNT

Good performance and nice configuration.

LINDA HUNT

Error messages on a new machine?

$3,350, www.digitalstormoneline.com

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GETS DOWN

LETS YOU DOWN

Turbo-Cool® 510 Power Supply

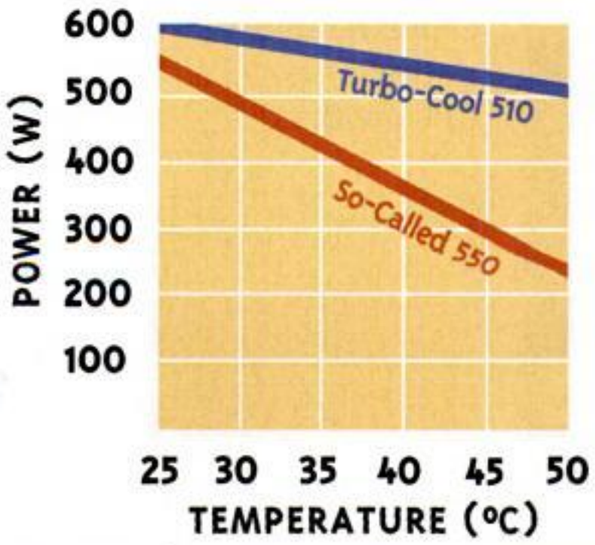
So-Called "550" Power Supply

Power @ 25°C:	**600W**	**550W**	Rating requires room temp. < 55°F
Power @ 40°C:	**550W**	**366W**	40°C is a typical power supply temp.
Power @ 50°C:	**510W**	**244W**	50°C is the spec for a commercial PC
+12V Output:	**34A/38A**	**24A**	**50% more power for CPUs and drives**
Regulation:	**1%**	**5%**	**Turbo-Cool's voltages are 5X tighter**
Ripple:	**10mv**	**50mv**	**Turbo-Cool's outputs are 5X cleaner**
Max. Cooling:	**44 cfm**	**40 cfm**	Tests show "550's" 2nd fan is ineffective
Active PFC:	**Yes**	**No**	Continuous range line conditioning
Voltage Pots:	**Yes**	**No**	Adjustments for system fine tuning
Intel Listed:	**Yes**	**No**	Turbo-Cool 510 tops Intel's ATX12V list
Warranty:	**5-Years**	**1-Year**	Reliability and longevity indicator

MAXIMUM PC Dream Machine 2004

- **Check Our Website for *Ten* 510 Reviews!**
- **New Turbo-Cool® 510 PCI Express Available!**

Don't be Misled by Wattage Claims!



*Even though the ambient temp. in a power supply is at least 40°C (104°F), most manufacturers unrealistically assume 25°C (77°F) in order to exaggerate their wattage claims. Since the proper full-load rating is 15°C higher, these power supplies produce **33% less power than their advertised ratings** as shown on the derating chart.*

Turbo-Cool 510 operating temperature spec: *full load @ 50°C.*
So-Called 550 manufacturer's spec: *full load @ 25°C, decrease to no load @ 70°C.*

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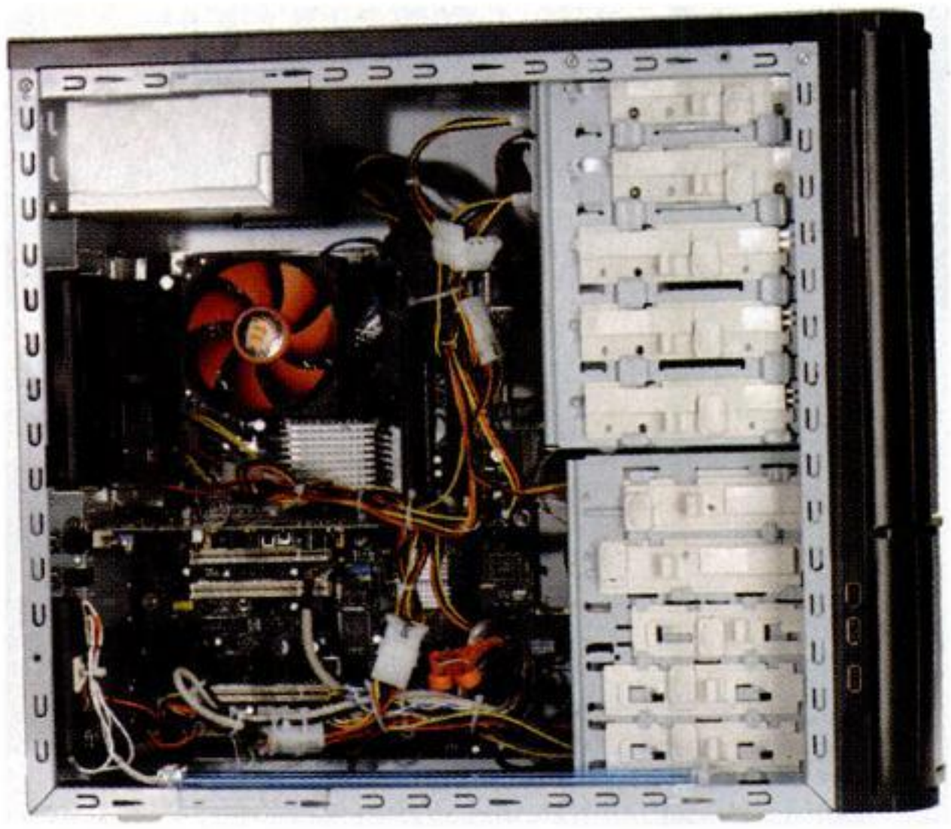
ZT Group Pro Gaming PC

Intel's exciting new 1066MHz FSB Pentium 4 Extreme Edition gets dissed by a slow-ass ATI X600 card



"Pro Gaming PC" is a misnomer. When you combine a fast frontside bus and a slow videocard, bad things happen. And look at that wiring job!

Peanut butter and chocolate we get. Hell, we even understand the Captain and Tennille. But we'll never, ever understand the odd pairing of a fast CPU with a slow videocard. This is the type of configuration ZT Group, a PC builder located in New Jersey, chose for the company's first submission to *Maximum PC*. While the rig packs Intel's latest and greatest CPU—the 3.47GHz Pentium 4 Extreme Edition operating on the chipmaker's exciting new 1066MHz frontside bus, the presence of ATI's X600 Pro card brings it down. Way down. The X600 features a four-pipe graphics chip that uses straight 128-bit DDR instead of G-DDR3 or DDR2. In its low-end class, it's a decent performer, but pairing it with Intel's fastest CPU in a machine called "Pro Gaming PC" is senseless.

The PCI Express graphics card and new CPU are fitted into an Intel D925XECV2 motherboard that uses the new Intel 925XE chipset. Intel chipset buffs will recognize the "E" designator, which indicates faster bus speeds and more features than the standard chipset, as with the 845E and the 850E. In this case, the 925XE chipset takes the frontside bus from 800MHz to 1066MHz. In addition to the x16 PCI-E slot, the board features four PCI slots and two x1 PCI-E slots, all six of which are wide open for expansion as ZT Group opted to use the board's onboard HD audio instead of the standard Sound Blaster card.

Storage duties are handled by a single 160GB Seagate 7200.7 SATA drive, which feels wimpy in this age of 300GB hard drives. A pair of LG drives takes care of optical chores; one of the drives is able to write to both plus and dash formats as well as the long-dead RAM format. Pardon us for sounding ungrateful, but we'll take double-layer over RAM any day of the week.

Everything is wrapped in a Cooler Master Cavalier enclosure with a front-mounted sound meter and clear case window. We typically appreciate the aesthetic of a case window, but not in this situation. In our opinion, a PC with a case window should not only showcase superior parts, but also a super-clean wiring job. The ZT Group's wiring methodology is akin to the technique we used to clean our rooms when we were seven years old: Throw everything into the closet and push on the door until it shuts. Every wire in our test rig was simply—and messily—bundled together and then tightly zip-tied. So tight, in fact, that the pass-through bracket for the case's sound meter ripped off during shipping.

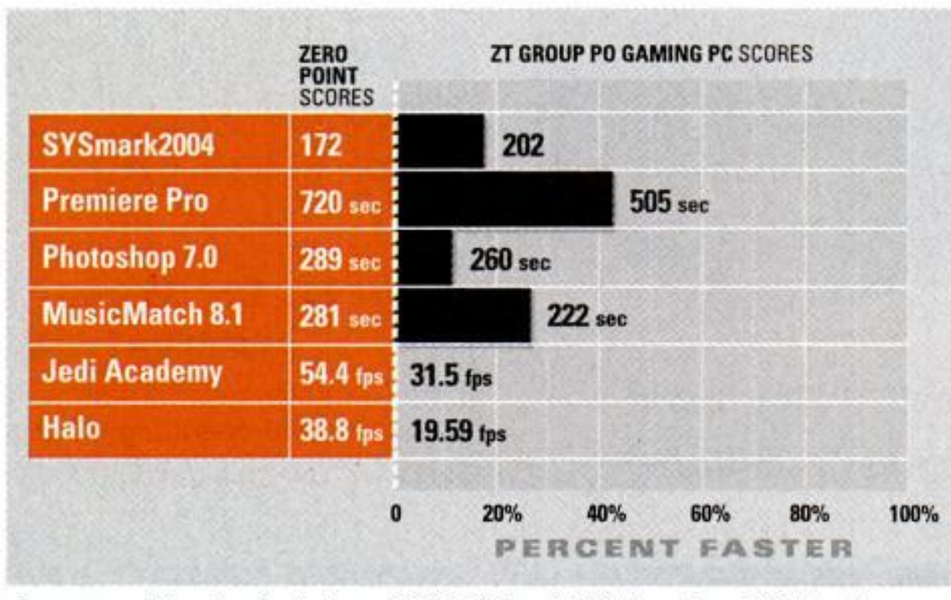
Performance-wise, the Pro Gaming PC did a good job on benchmarks that circumvent videocard utilization. In *Premiere Pro*, the PGP was just a tick off the very fast Velocity Pro Magix box we reviewed last June. It also measured just ahead of the Velocity Pro Magix in *Photoshop* and tied that rig in our *MusicMatch* tests. In *SYSmark 2004* though, the Pro Gaming PC fell behind by almost 10 percent. That's likely due to the absence of RAID and the higher latency of the DDR2 RAM. The saddest fact, however, is that our almost year-old zero point system smoked the Gaming PC in *Halo* and *Jedi Academy*.

Tsk, tsk. That's just not right—especially in a machine dubbed the Pro Gaming PC.

—GORDON MAH UNG

UNDER THE HOOD

THE BRAINS	
CPU	Intel 3.47GHz Pentium 4 Extreme Edition
Mobo	Intel D925XECV2 using Intel 925XE chipset
RAM	1GB Registered DDR2 533 Crucial Technology (two 512MB)
I/O ports	Six High-Speed USB 2.0, one serial, one parallel, one FireWire, optical SPDIF
LAN	Integrated Gigabit (Marvell phy)
DISPLAY	
Videocard	ATI Radeon X600 Pro 128MB (398MHz core, 337MHz DDR)
STORAGE	
Hard drive	Seagate 7200.7 160GB
Optical	LG GSA-4120B (8x DVD+/- R, 4x DVD+/-RW, 3x DVD-RAM, 24x CD-R) LG GDR-8162B
AUDIO	
Soundcard	Onboard HD Audio
FINE DETAILS	
Case	Cooler Master Cavalier
Fans/extras	One 120mm, one 80mm, cold cathode, media reader
Mouse	Logitech Wheel Mouse
Keyboard	Logitech Internet Keyboard
BUNDLE	
Windows XP Pro, CyberLink PowerDVD, Ahead Nero Express	
BOOT: 37 sec.	**DOWN: 30 sec.**



Our zero-point system includes: a 2.2GHz Athlon 64 FX-51, an Asus SK8N motherboard, 1GB of Corsair Registered TwinX DDR400 RAM, an ATI Radeon 9800 XT, a 250GB Western Digital WD2500JB hard drive, Plextor PX-708A DVD burner and a PC Power and Cooling TurboCool 510 Deluxe power supply.

MAXIMUM PC VERDICT 5

+ SPEED LOADERS

Reasonably priced.

– HALF MOON CLIPS

Funky, slow X600 graphics card and tangled wiring job.

$2,350, www.ztgroup.com

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Rio Carbon 5GB MP3 Player

Wherein the iPod Mini suffers a mortal wound

You've got to hand it to Apple—the iPod family of MP3 players is so iconic that every new MP3 player is immediately challenged with the same review cliché: "Is it an iPod killer?" The Rio Carbon is not. But paradoxically, it's a superior device.

The Rio Carbon uses Seagate's miniature 5GB drive, putting it a gigabyte over the capacity of the iPod Mini. Even better, the openness of the Carbon makes the iPod Mini look positively uptight. You don't need proprietary management software to load tracks onto it (although software is included for creating playlists). Instead, the player shows up as a removable hard drive in Windows Explorer, and from there you're free to transfer music *and* data files onto it. Tracks within folders—even folders several levels deep—are also recognized. The sound is delectably vivid, and can be further shaped with the five-band graphic equalizer the iPod Mini lacks.

The display is as crisp and titillating as the dark-red backlit buttons and the curvaceous shape (which is more comfortable to hold and to pocket than the iPod Mini). We can even forgive the lack of a Hold button because not once during our abusive go-round was a button accidentally pressed. Best of all, the battery life absolutely crushes the iPod Mini at more than 19 hours on a single charge at 75 percent volume.

True to *Maximum PC's* perfection-seeking character, we have quibbles. The carrying case is awful; it prevents us from operating the player, and removing it from the case is an awkward chore. Audio is disabled during fast-forward, and there's no fast-advance equivalent of the iPod Mini that allows you to quickly jump to any point in a track. Furthermore, we're flummoxed by the absence of OGG or FLAC support, both of which are present in the 20GB Rio Karma. (The player does support the Audible audiobook format, and can bookmark your place in these tracks.) We also would have liked to see an on-the-fly playlist function comparable to the one in the iPod Mini.

As comfy to hold as it is comely to behold, the Rio Carbon reinforces for us the notion that great MP3 players should be more than just a patented interface.

The Rio Carbon isn't an "iPod killer" because it won't seduce those who prefer the Apple convention of restricting choice in favor of "ease of use." Instead, it delivers the do-it-your-way music management system and broader format compatibility that PC users expect. It's got the right attitude, and the right hardware. Apple could learn a thing or two from this media player.

—LOGAN DECKER

Plays: MP3, WMA (incl. protected files), Audible

MAXIMUM PC VERDICT 9

+ SANTA'S REINDEER

Convenient, intelligent music and data file-management. Looks sweet.

– COURTNEY LOVE'S CAREER

No OGG or FLAC support. Ridiculous carrying case.

$250, www.digitalnetworksna.com

Sicuro 5.1 Gaming Speaker

Why we thought we were encircled by five alarm clocks

If you look at the speakers pictured here and feel your internal crap-o-meter going off, do not be alarmed. It does not need recalibration. Here's what probably set it off: the heavy use of faux chrome, the complete lack of a control pod or volume knob, cheesy enclosures made of colored plastic, and the piece de resistance—a "techno-lighting effect" that causes each satellite to flash colored LEDs in sync with the music. All these features conspire with the most pathetic sound output we've ever heard in a 5.1 speaker system to create a product that is just begging to be used as a gag gift for an audiophile.

Let's begin with the satellites. The sound output from each of the 15W satellites is incredibly weak, and lacks any midrange whatsoever. Sure, each satellite flashes an LED in sync with the music, but you have to turn them up quite a bit to get the flashing going. You can toggle the "techno lighting effect" on or off via a button on each satellite's base, but it's a hassle to toggle the speakers individually.

None of the satellites has a volume knob, nor is there a control pod. No, that would be too easy. Instead, the controls are mounted—get this—on the base of the subwoofer. Luckily, the system includes a wireless remote control. Because these speakers are best suited for the dark—what with the lighting effect—it would make sense for the remote to be backlit; the Sicuro 5.1's isn't.

The subwoofer—also equipped with said lighting effects—is a joke. We've heard flatulence that was deeper than this. During Lab testing, one staffer wondered if the subwoofer was even turned on (it was). Both the subwoofer and the satellites were eerily silent for long portions of our 20Hz-to-22KHz sweep, being simply unable to produce any sounds at the high and low ends of the sound spectrum.

Blue-light special on Aisle 7? No, the blue lights are LEDs that flash in sync with the music.

The final insult is the price. It's hard to believe, but this system costs 200 dollars. We suggest you save your money, go buy some stamps, and then start a letter campaign to your local elected official to get these speakers off the market before anyone actually purchases them.

—JOSH NOREM

MAXIMUM PC VERDICT 3

+ WARREN G

Good for a laugh, and they function when turned on.

– KENNY G

Too numerous to list.

$200, www.rwti.net

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The Two Towers

A pair of new PC case enclosures submit to the *Maximum PC* gauntlet

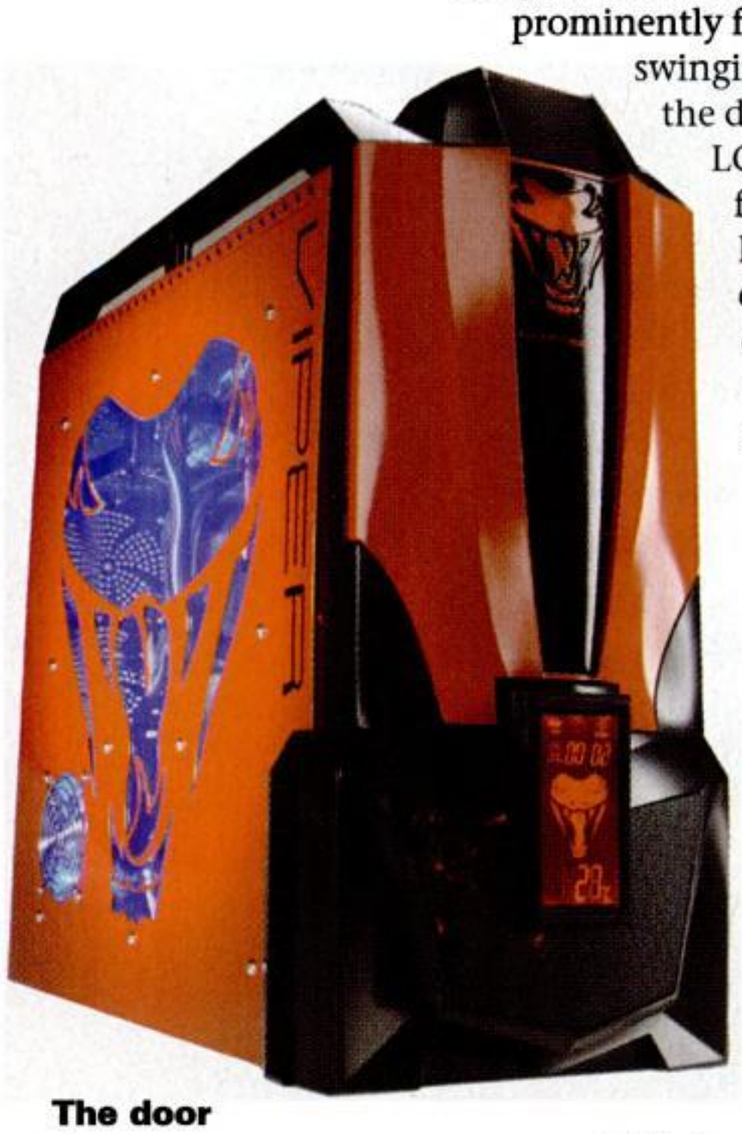
Think you can judge a case by its appearance? Take a quick peek at the two enclosures featured here and try to predict which is better. We think you'll be surprised.

—JOSH NOREM

Viper Extreme Gamer

Despite its overtly cheesy exterior, the Viper is quite respectable. It's a surprisingly sturdy, well-built structure that proves once and for all that a case can't be judged by its cover. (Gotcha, didn't we?)

This mid-tower enclosure uses steel construction, giving it a solid, rigid feel, and its built-in handles for LAN party travel impressed us with their sturdiness and reliability. The plastic front bezel comes straight from the pages of Falcon Northwest's design book, with a backlit snake prominently featured on the swinging bay door. Below the door sits a swanky LCD display that also features a snake logo as well as info on HDD activity, case temperature, uptime, and power status.



The door that covers the Viper's drive bay is adorned with a backlit logo a la Falcon Northwest.

Inside the case's roomy interior are 10 drive bays, which should satisfy even storage-hungry junkies. Unfortunately, the drive bays aren't tool-less, requiring old-fashioned screws. Cooling consists of an 80mm fan in front of the drive bays (which can be upgraded to a 120mm fan) and another 80mm fan attached to the case door. Two extra 80mm fan mounts reside above the AGP slot, but are empty in stock trim. The included 500W PSU has two 80mm fans that can be adjusted via a "fan speed" knob. The power leads, which include SATA connectors, are UV blue, making them a colorful complement to the UV reactive case window. On the downside, the mobo tray is not removable, which makes PC assembly a more laborious process.

Overall, the Viper Extreme is an impressive case despite the "cheap" character its design implies. Indeed, it's a killer rig for the money.

MAXIMUM PC VERDICT 9

ESKIMO KISS

Ample cooling, slick LCD display, and well-stocked.

SNAKE BITE

Requires tools for drive and PCI card installation.

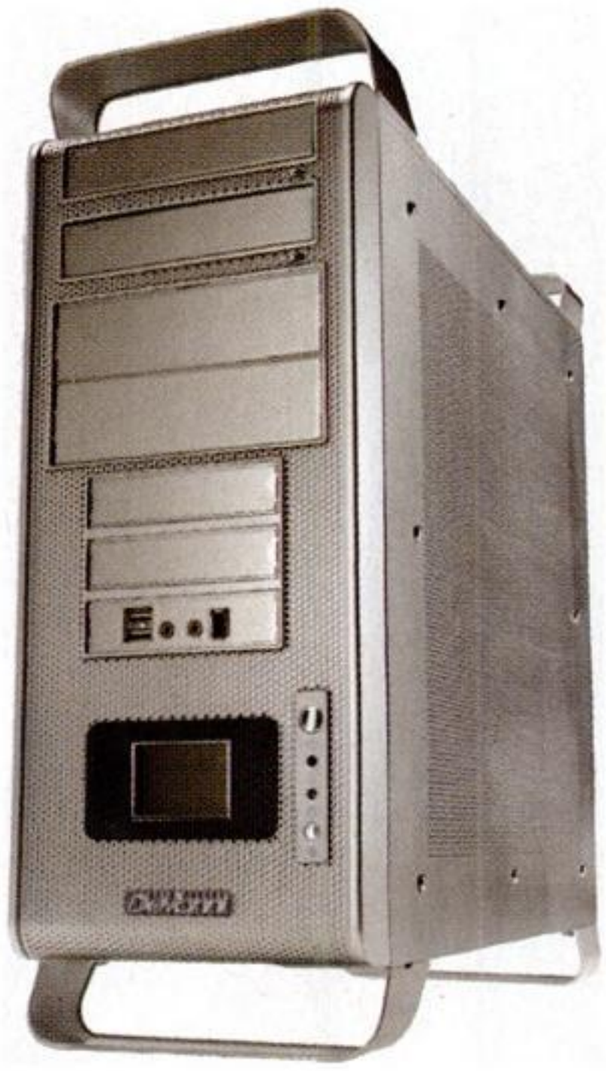
$100, www.xgbox.com

Devanni Nitrous 7105 Silver

Although the Apple G5 isn't as fast as a high-end PC, its clever design is certainly worth mimicking, which is why we're now seeing PC cases follow in its footsteps. The Nitrous 7105 is one such imitator, and while it does an OK job of recreating the G5's sexy brushed aluminum exterior, it's not without a few semi-serious flaws.

As you can see, the entire exterior is made of aluminum mesh. Both the sides and top are ventilated, as is the front bezel. However, the front bezel has a solid aluminum backing, so no airflow is possible through the front of the case. Compounding this overheating disaster-waiting-to-happen is the lack of any fan mount in the lower portion of the case. Instead of allowing room for a fan, you get a nifty LCD display that shows the temperature of an included probe (you can mount it wherever you like), as well as digital displays for hard drive activity and power. It's a cool-looking display, for sure, but it's only legible when you're directly in front of it, meaning that if your case is on the floor you'll have to get down on your knees to read it. The two handles you see atop the case are removable via thumb screws, and make transporting the case a lot easier.

Thankfully, building a PC in this



This case looks darn close to a G5, right down to the aluminum handles and feet thingamajigs. But its cooling capabilities are lacking.

case is a snap. All of the drive bays are easy to work with and use plastic locks to keep drives secure. We also like that the top two 5.25-inch bays include folding doors that are part of the bezel; when you hit the button to open the drive, the bezel door slides down and the optical tray slides out from behind.

Front I/O is perfect, with FireWire, audio, and two USB 2.0 ports. Unfortunately, there is no motherboard tray, and the only cooling apparatus is a mount for an 80mm fan near the AGP slot. No power supply is included.

The Nitrous 7105 is a decent enclosure that's lightweight and easy to work with. Unfortunately, the lack of any cooling whatsoever for the hard drives is a glaring flaw—there may be enough bays for six hard drives, but heat concerns would make us wary of running more than one.

MAXIMUM PC VERDICT 7

SNAPPLE

Tool-less drive bays, and very light.

APPLE

Only one fan mount, and LCD display is largely unreadable.

$88, www.ditcorp.com

Copyrighted material

Apex MP-200 Portable Video Player

A dim view of video-to-go

Now that we've taken Creative's Zen Portable Media Center for a walk around the block (it received a 6 in November 2004), a little light's been shed on Microsoft's new Portable Media Center platform. In a nutshell, it's cool if you can stay within the confines of what's permitted by the built-in digital rights management. But there are non-PMC alternatives, such as Archos' AV420 (which received a 9 in October 2004), iRiver's PMP-120, and now the MP-2000 from Apex Digital.

The Itty Bitty Vidi Committee says pass on the MP-2000. It'srelatively inexpensive, but you'll be glad you spent the extra bucks on a better player.

Don't think the MP-2000 is an anarchic DRM-free zone, however, just because it doesn't use the Portable Media Center OS. In fact, it's even more restrictive than the AV420, which allowed us to record copy-protected video in real time through the line-in jack, but only for playback on the device itself. The MP-2000 doesn't even permit this much freedom, returning a "Video Copy Protected" message and turning the record function off. (We think it uses Macrovision's copyrighted material flag as a guide.)

Even if you're content with playing back your own DivX content, the MP-2000 will likely still disappoint. Although it performed on par with the AV420 when reading a sampling of DivX files encoded at various bitrates, it can only decode MP3 audio, and cannot play back multichannel AC3 (Dolby Digital) sound. So if you hoped to downmix the surround-sound DivX files you enjoy at home to two-channel AC3 audio on the MP-2000, forget it—you'll get no audio whatsoever. This is a serious omission, although one that could be corrected with a firmware upgrade.

But then again, the MP-2000 is definitely not the portable video player for those with high expectations. The 3.5-inch TFT screen has a very coarse dot pitch. The resulting image—appearing as if overlaid with a fine grille—is tolerable most of the time, but completely obscures fine details (for example, the whiteboard communication between survivors in the 2004 remake of *Dawn of the Dead* is extremely difficult to make out). This problem is compounded by the signal loss inherent to video compression—bad news for a 20GB player that requires heavy compression in order to save space.

Furthermore, you can't charge the unit through a USB port, and absolutely no tools are included for converting VOB or MPG video files to the DivX format. And while it's an MP3 player and picture viewer, there's no memory card slot, so it won't help photographers on the go, and given the device's other shortcomings, MP3 playback doesn't add much value.

On the positive side, we like the carrying case that doubles as a hands-free viewing stand, and the battery life clocked in at an acceptable 4:41 (hours:minutes) at 75 percent volume and brightness before pooping out. But these pleasantries aren't enough to warrant a recommendation for a portable video player.

—LOGAN DECKER

MAXIMUM PC VERDICT 5

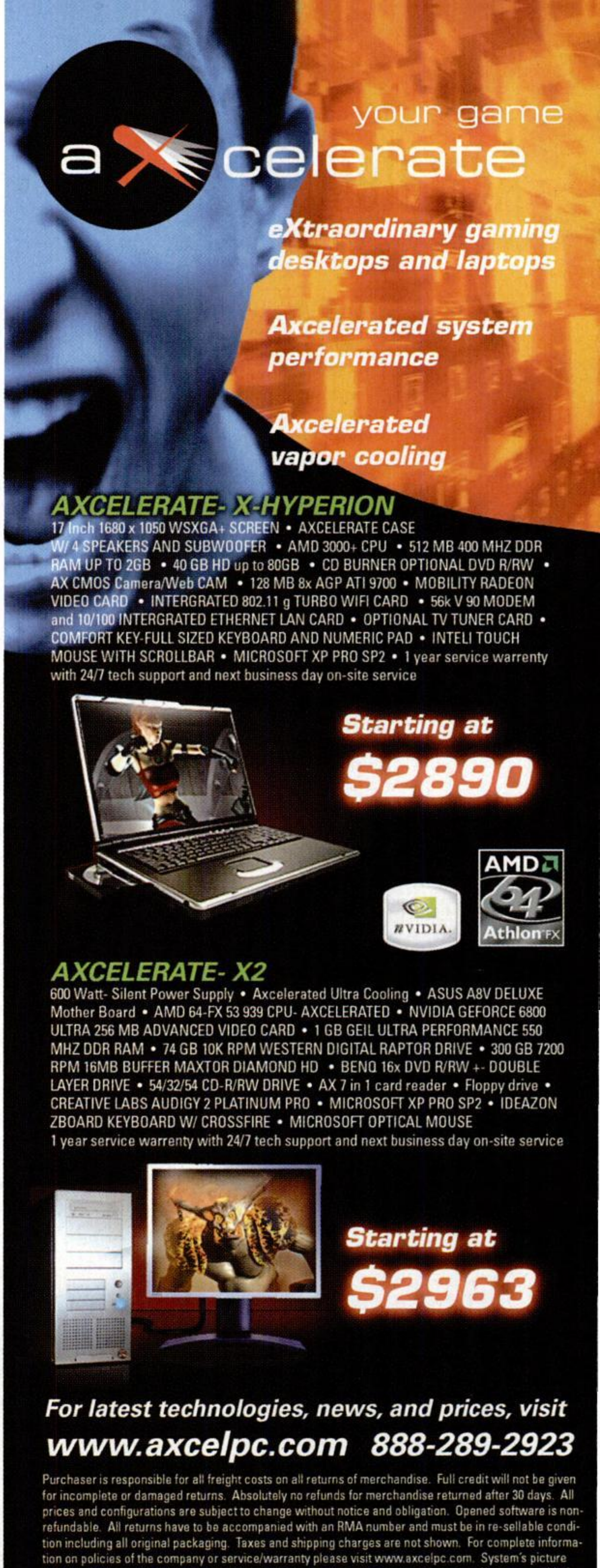
+ IMAX

Good battery life and clever protective carrying case/stand.

– VIDEO BOOTHS

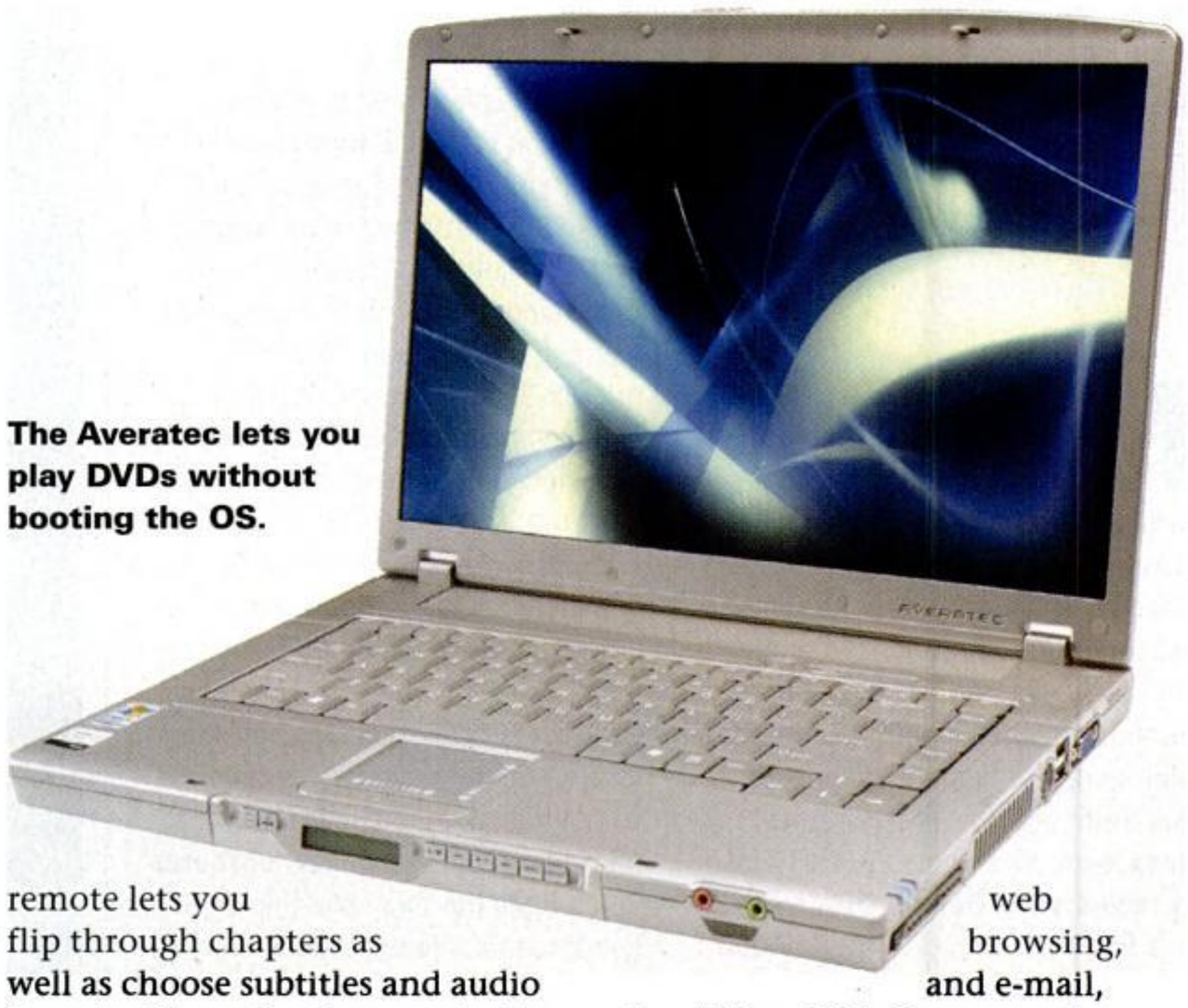
Poor screen, and doesn't decode AC3 audio.

$400, www.apexdigital.com



Averatec 6200

We like to think of it as a big-ass DVD player



The Averatec lets you play DVDs without booting the OS.

We've never been impressed by low-cost notebooks, which tend to sacrifice so many features they feel like a car without a spare tire or rear window defroster. Thankfully, the 6200 isn't one of these, sporting an interesting blend of features that make it a noteworthy budget portable.

The most compelling feature is that you can play up to 4.5 hours of DVD movies on a single battery charge. Averatec accomplishes this—without using two batteries, we'll add—by taking advantage of what has become a plethora of low-cost MPEG2 decoding chips made for single-purpose portable DVD players and DVD decks. Because the 6200 uses one of these chips—which handles all DVD, MP3, and audio functions, it can boot into a power-saving pre-OS environment where it can be used to play CDs, DVDs, and MP3 discs instead of forcing you to wait the minute or so it takes Windows XP to boot.

How much power does it save? Consider this: The zero-point notebook we compared it with needs two batteries to reach the same playback time.

To aid in DVD viewing, a nifty PC Card-size remote lets you flip through chapters as well as choose subtitles and audio formats. Elegantly, the remote slips into the notebook's single PC Card slot when not in use.

Unfortunately, this impressive battery life comes at the expense of visual quality. The movies we watched using the built-in decoder chip looked dull and soft when compared with playback in CyberLink's *PowerDVD* running in Windows XP on the same laptop. Because the DVD playback mode lacks the ability to tweak image quality, there was little we could do to sharpen the image.

The 6200 is powered by AMD's Athlon XP-M 2400+, a 1.8GHz Athlon XP using the Barton core with AMD's PowerNow! technology, which steps the processor speeds down as usage levels drop. While this mobile XP chip can outgun the two-year old 1.7GHz Pentium 4M we use as a zero-point, it gets smoked by modern Pentium M/Centrino-class CPUs. If your mobile work is limited to DVD viewing, light-duty *Photoshop* work, web browsing, and e-mail, the Athlon XP-M has more than enough pep. For gaming, however, it's a dud. With its integrated graphics, it was incapable of running our 5-year-old *Quake III* test. Because we couldn't achieve a 1280x1024 resolution—the minimum resolution required for the benchmark—we were unable to obtain any results. Obviously, you shouldn't expect to use this laptop to play much beyond *Solitaire*.

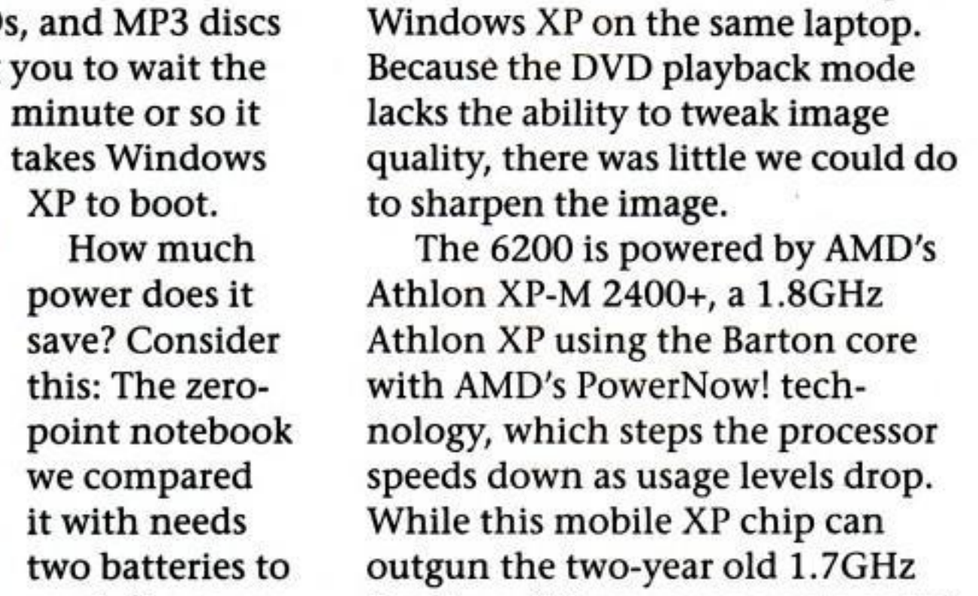
Storage is a 4,200rpm, 60GB Hitachi Travelstar 80GN with an 8MB buffer and a Lite-On 24x CD-R combo drive. The model we reviewed didn't feature a DVD burner, but Averatec has since added it as standard equipment. There's no Bluetooth, but you do get 802.11g, which is backward-compatible with 802.11b access points.

We'll admit we didn't expect a whole lot from the Averatec 6200, but overall, it's a pretty serviceable notebook for the money. If you're looking for a notebook that will give you long-haul movie viewing and basic computing capabilities, the 6200 is surprisingly satisfying and won't break your back—or the bank.

—GORDON MAH UNG

UNDER THE HOOD

THE BRAINS	
CPU	1.8GHz Athlon XP-M 2400+ (333MHz / 512KB L2 cache) using SiS M741 chipset
RAM	512MB DDR333
I/O ports	Four High-Speed USB 2.0, Fast Ethernet, modem, S-video out, VGA out
LAN	SiS 900, 802.11g
DISPLAY	
Video	SiS M741 integrated
Display	15.4-inch (1280x800@32-bit)
STORAGE	
Hard drives	Hitachi Travelstar 80GB 4,200 RPM 8MB buffer
DVD-ROM/ CD-RW	Lite-On DVD/CD-RW Combo Drive 24x CD-R
AUDIO	
Audio chip	Realtek AC97
Other	PC Card remote, built-in MPEG2 decoder
TIPPING THE SCALES	
Lap weight	6 lbs
Carry weight	6.8 lbs
BUNDLE	
Windows XP Home, Norton Antivirus 2004, Roxio EasyCD Creator 6	
BOOT: 34 sec.	**DOWN: 11 sec.**



*Our zero-point notebook is a Dell Dimension 8200, and includes a 1.7GHz P-4M CPU, 256MB DDR266, a 64MB 128-bit DDR GeForce4 Go graphics chipset, and a 5400rpm IBM Travelstar 60H hard drive. *Our notebook Photoshop 7.0 test differs from our new desktop Photoshop test.*

MAXIMUM PC VERDICT 7

ANCHOR STEAM

Incredible DVD playback times and a wide screen for $1,200.

LUCKY LAGER

Integrated graphics core and no DVD burner.

$1200, www.averatec.com

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CREATIVE

www.us.creative.com

The power of ZEN MICRO

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- 5GB
- Micro sized
- Removable 12 hour battery
- Intuitive vertical touch pad control
- FM radio

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iPaq Attack!

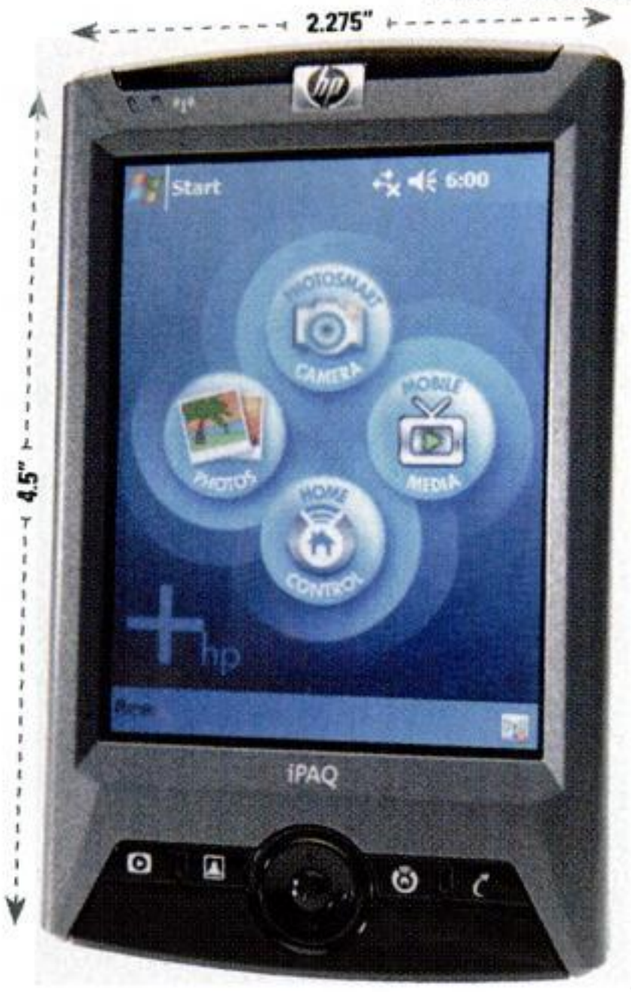
Two new handhelds from HP break bold new ground—but ultimately fall short

It takes some real *huevos* for a company to expand its line of handhelds while everyone else is fleeing the market. But that's exactly what Hewlett-Packard is doing. Two new models in particular demonstrate a high level of adventurousness in the HP labs—one is designed for mobile media, and the other sports the first VGA screen to appear on an HP handheld. Read on to find out what kind of case HP is making for the future of the PDA.

—LOGAN DECKER

iPaq rx3715 Mobile Media Companion

Under the rx3715's bonnet is a Samsung S3C 2440 400MHz proc (running Windows Mobile 2003 SE) with 56.66MB of main memory, plus an additional 96MB of storage in the iPaq File Store (a special segment of flash memory reserved exclusively for data storage). You also get Wi-Fi, Bluetooth, IrDA, USB connections, and a bright, beautiful 3.5-inch display. Sounds good so far.



The Mobile Media Companion is a great idea to extend the usefulness of PDAs. It just needs more thinking—and more functionality.

But we found ourselves disappointed with many of the device's bells and whistles. As an example, take the integrated 1.2 megapixel camera (1280x960). Image quality is suitable for traffic accident documentation at best. All the pictures we took turned out blurry, and the video recording quality (maxing out at 176x144) is atrocious. Another example: The *Mobile Media* app streams music and video from your wireless network, but supports only Windows Media audio and video. Pathetic.

The Home Control universal remote function is the most successful module of the bunch. It turns the rx3715 into a universal remote for your (complex) living room system, so you never have to strain to find the right "clicker," as Pops calls it. Configuration is so easy that it falls just short of being done for you, and the remote quickly "learns" infrared commands from older electronics not resident in the software's database.

The rx3715 is a handsome little fella—no doubt about it—and boasts an astounding battery life of almost 10 hours of nonstop use with the backlight at 75 percent. But tragically, perks such as the sub-par camera and streaming media software bloat the price and drag down this otherwise smart handheld.

MAXIMUM PC VERDICT 7

EYE CANDY

Generous helping of memory, beautiful screen, and excellent universal remote.

PINK EYE

Disappointing camera, and streaming media supports only Windows Media.

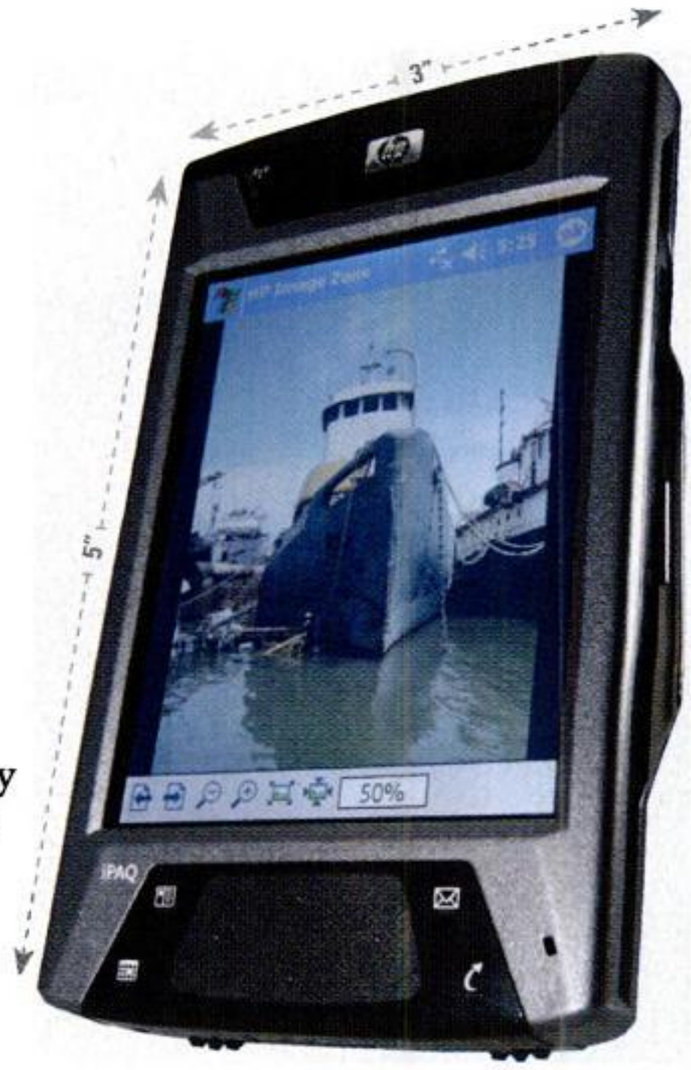
$500, www.hp.com

iPaq hx4700

Surprisingly light and thin, this monolithic black slab had us dancing around it like monkeys. But its two most distinctive features—trackpad navigation and a VGA screen—didn't keep us away from our daily lunch of bananas for long.

The specs—and the price—are worthy of a flagship handheld. The proc is the PXA270—Intel's finest—running at 624MHz, with 62.28MB of free main memory and another 80MB waiting in the iPaq File Store. Connection options include Bluetooth, Wi-Fi, and IrDA, and unlike the rx3715, the hx4700 also includes a CompactFlash slot.

The touchpad is a dud, and is difficult to use even after basic training. Reading an eBook, for example, requires only a light tap on one side



In the swimsuit category, the hx4700 trounces all other handhelds we've seen. But it takes more than beauty to win over the editors at *Maximum PC*.

to "flip the page," but if you miss the mark by even a little, you'll get flung backwards, or to another chapter altogether. Playing games? Not unless you remap the controls to the four traditional buttons, which are spread out at the corners of the trapezoidal pad. That doesn't work for us.

Although the 4-inch VGA is spectacularly bright and crisp in applications and web browsing, we were shocked to discover that it doesn't fare well playing video. Bright scenes are ripe and luscious onscreen, but any video with a preponderance of black suffers from high glare, especially in landscape mode. The battery life clocked in at just over seven hours of constant use with the backlight at 75 percent.

It appears that HP is on to something interesting and possibly even revolutionary in terms of PDA functionality, but we recommend that you hold onto your paycheck until the company gets it right.

MAXIMUM PC VERDICT 6

YOGLOO

Good looks, fast proc, and VGA screen is fantastic for applications.

EYE GOO

Touchpad sucks, and video playback has too much glare.

$650, www.hp.com

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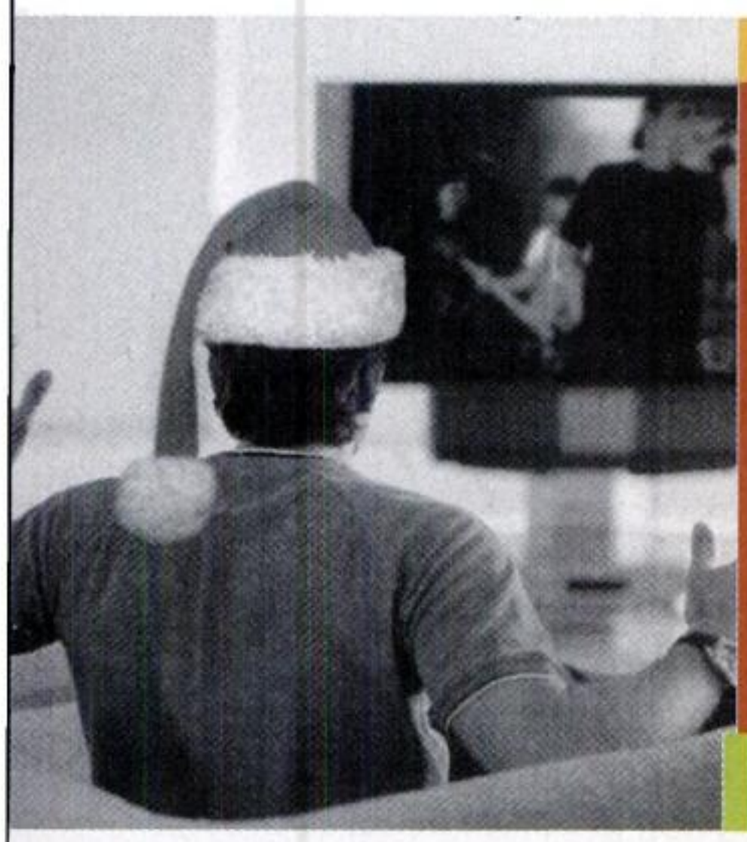
Experience a new world of digital entertainment.

Store and manage your music or photos from your ZT Pro System based on the Intel® Pentium® 4 Processor with HT Technology. And use a digital media adapter to enjoy them on connected TVs or stereos in any room at home. It's an exciting new world.

ZT recommends Microsoft® Windows® XP Media Center Edition



ZT PRO Media Center PC X6555

Intel® Pentium® 4 Processor 540 with HT Technology (3.20 GHz, 1MB L2 Cache, 800MHz)
Microsoft® Windows® XP Media Center Edition 2005
TV Tuner & Remote Control
Intel® D915GAVL Mainboard
512MB PC3200 Dual Channel DDR400
Seagate® 160GB Serial ATA/150 (8MB Cache) Hard Drive
7 in 1 Media Reader
128MB ATI RADEON™ X600 XT w/TV-Out & DVI "PCI EXPRESS"
16x DVD±RW & CD-RW Combo Drive
Creative Labs SB Audigy 2 ZS 7.1 w/ Firewire 1394
Intel® 10/100 LAN
Cooler Master MCE Chassis w/300Watt Power Supply
Logitech® Cordless MX Duo Keyboard & Rechargeable Optical Wheel Mouse
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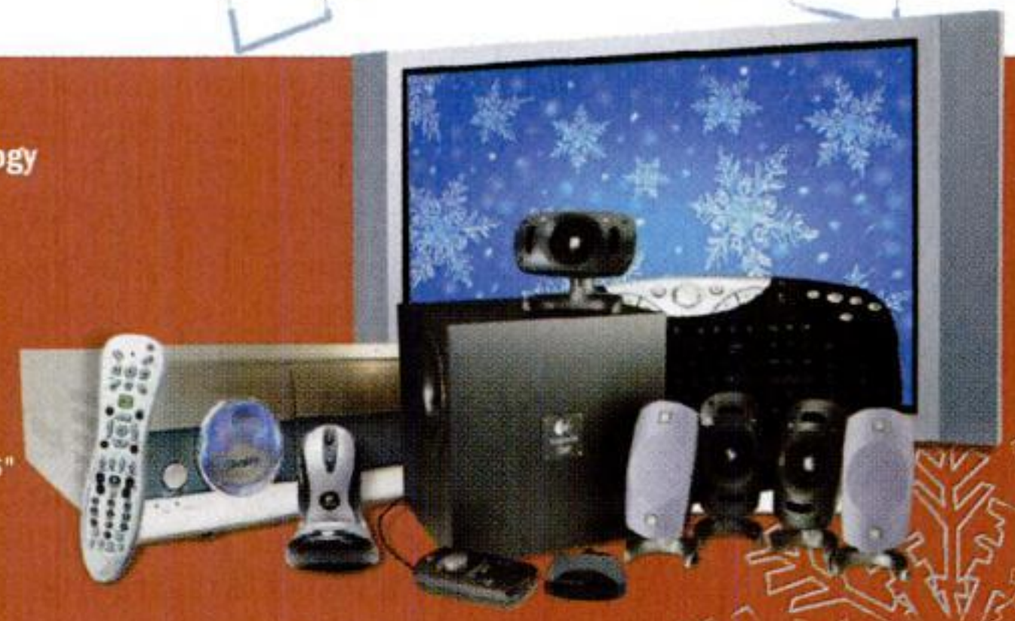
* Monitor sold seperately

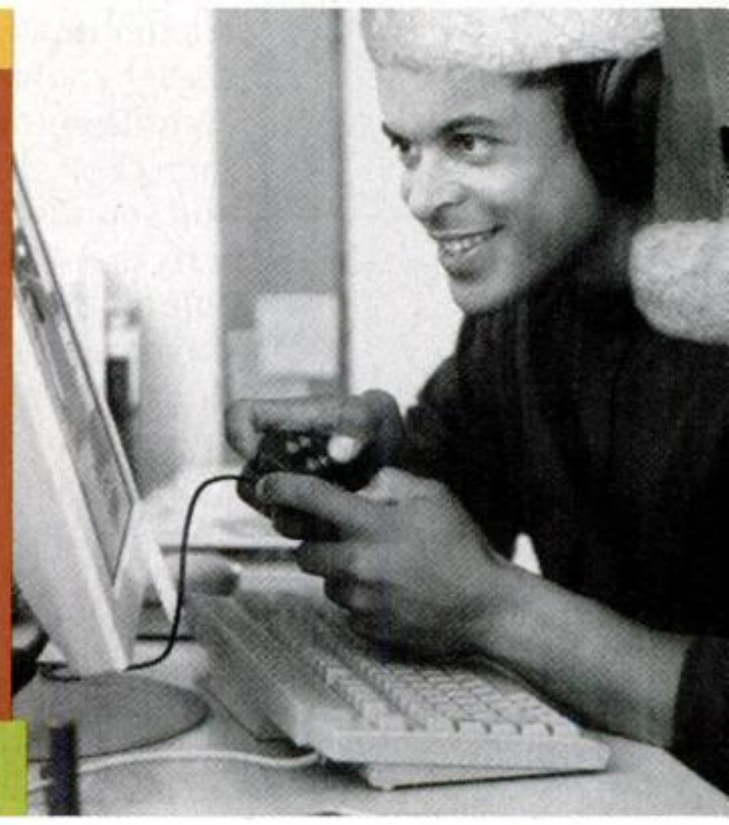


ZT PRO Gaming PC X6554

Intel® Pentium® 4 Processor 540 with HT Technology (3.20 GHz, 1MB L2 Cache, 800MHz)
Microsoft® Windows® XP Home Edition w/Service Pack 2
Intel® D915GAVL Mainboard
512MB PC3200 Dual Channel DDR400
Seagate® 160GB Serial ATA/150 (8MB Cache) 7200rpm Hard Drive
7 in 1 Media Reader
256MB ATI RADEON™ X600 PRO w/TV-Out & DVI "PCI EXPRESS"
16x DVD±RW & CD-RW Combo Drive
Intel® High Definition Audio
Intel® 10/100 LAN
Cooler Master MID Tower Chassis w/350Watt Power Supply
Logitech® Internet Keyboard & Optical Wheel Mouse
Logitech® X-620 6.1 6-Piece Speakers w/ Subwoofer
Microsoft® Works 7.0
3-Year Limited Warranty

$1,099

* Monitor sold seperately



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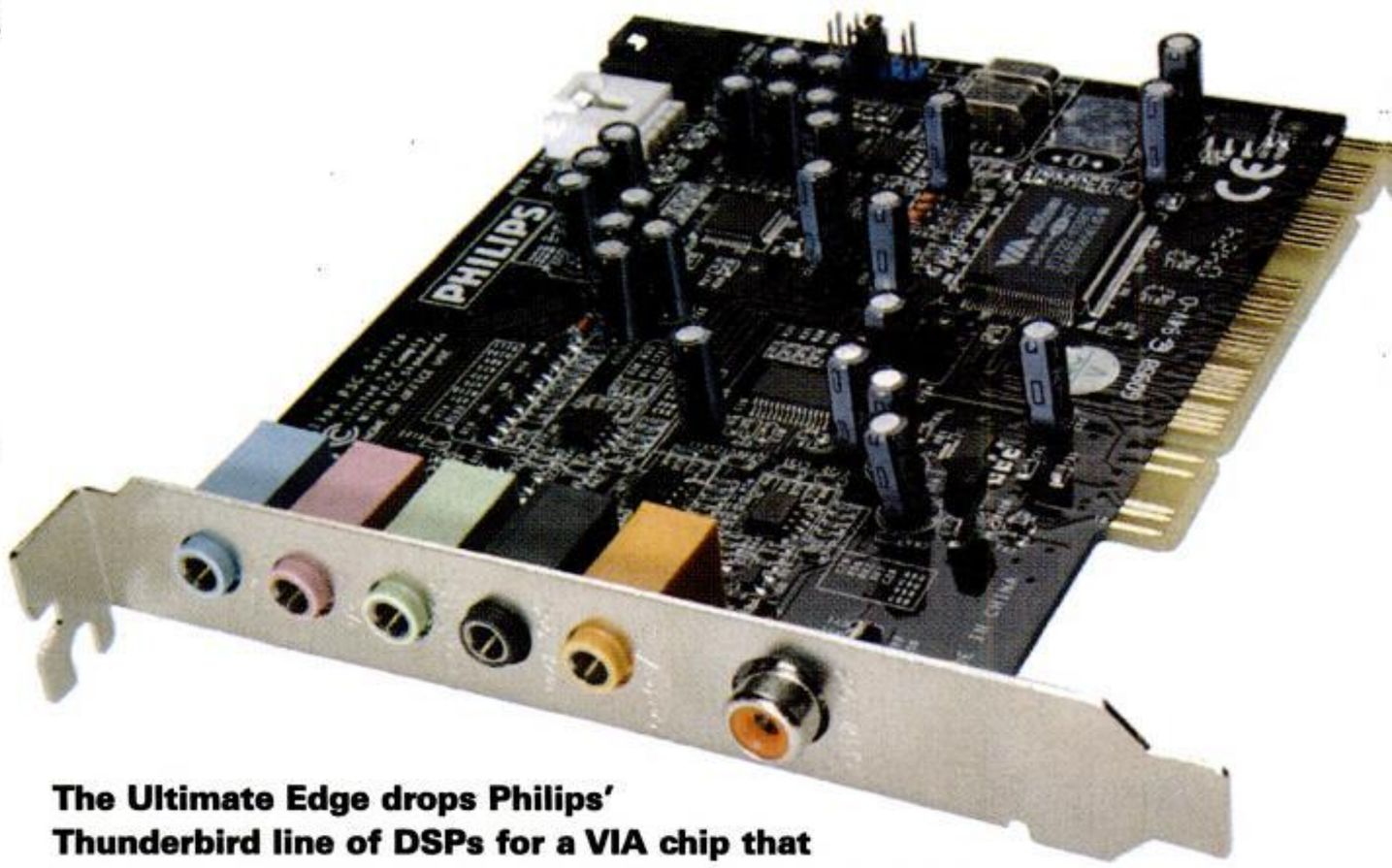
Philips Ultimate Edge PSC724

A complete alternative to Sound Blaster arrives, but with a significant cost in performance



The Ultimate Edge drops Philips' Thunderbird line of DSPs for a VIA chip that offloads a considerable amount of work onto the CPU.

Once a solid purveyor of hardware audio acceleration, Philips/VLSI has made an abrupt reversal with its new Ultimate Edge PSC724 soundcard. The 24-bit Ultimate Edge dumps the Thunderbird Avenger DSP that Philips used in its older Acoustic Edge soundcard for the ubiquitous VIA Envy24GT chip. A similar VIA chip is used to power the M-Audio Revolution 7.1, AudioTrak Prodigy 7.1, and a host of other competing cards.

Note that the word "powers" does not mean that the aforementioned chip does any actual audio processing. No. The Envy24GT is essentially a PCI bus-mastering chip that handles the flow of data between the audio converters and the PCI bus. Any crunching of data for positional audio, reverb, and other such effects is performed by the CPU.

When we test soundcards (an increasingly dying breed) in the Maximum PC Lab, we've found that the software, drivers, and algorithms often have a huge impact on the way a card performs and sounds. It's clear from our tests that Philips spent a considerable amount of time polishing its drivers and supporting applications. Of the Envy24 cards we've reviewed to date, the Ultimate Edge has the most advanced audio applets and controls we've seen. The controls are centralized, easy to understand, and much better than the competitors' offerings.

Audio quality is a slightly different story. The card uses a pair of Wolfson Microelectronics WM8766 24-bit 192kHz codec chips to convert digital to analog. The same codecs are used in AudioTrak's Prodigy 7.1, which explains the audio similarities between the two. In subjective listening tests using high sample-rate audio, we found the Ultimate Edge sounded a little dull when compared with an Audigy 2 ZS. (We felt similarly about the Prodigy 7.1.) We were able to EQ the Ultimate Edge to compensate for the flatness, but even so, the Audigy 2 ZS maintains a slight edge.

In gaming, the Ultimate Edge holds its own in sound quality, even though it doesn't support Creative's proprietary EAX3 and EAX4. But you pay a steep price in performance. We've wondered for a long time now whether accelerated soundcards would go the way of the MPEG2 decoders. With gigahertz to burn, we've reasoned, do you really need a DSP?

It sure looks like it. We used our standard Athlon 64 FX-51 test bed and ran *3DMark03*, *UT2003*, *Quake III Arena*, and *Comanche* in 5.1 mode (the highest the Ultimate Edge supports) and saw 10 percent frame rate penalties. That's pretty painful, especially when you consider the performance hit in another way: If you spent $500 on your videocard, a 10 percent hit in frame rates is going to reduce performance to the equivalent of a $400 videocard. The same reduction is also going to affect your CPU, effectively knocking it down a speed grade or two.

This may make gamers reel in horror, but a massive countertrend is rearing its head that may ultimately render DSPs worthless: Games may stop supporting them. Id's *Doom 3*, for example, does all the audio processing on the CPU. Valve's *Half Life 2* and GSC's *S.T.A.L.K.E.R.* are expected to do the same. If this practice continues, a hardware accelerated card won't make any difference whatsoever in your gaming.

—GORDON MAH UNG

DARE to COMPARE	ULTIMATE EDGE	AUDIGY 2 ZS	PERCENTAGE DIFFERENCE
3DMark03	-	-	-
No sound (fps)	**50.1**	49.1	2.0%
24 sounds (fps)	38.3	**43.6**	-12.2%
60 sounds (fps)	34.1	**38.1**	-10.5%
UT2003 Demo	-	-	-
Software 3D (fps)	70.0	**81.5**	-14.1%
Hardware 3D (fps)	62.7	**71.2**	-12.0%
Hardware 3D + EAX (fps)	62.0	**67.4**	-8.0%
Quake III Arena (fps)	240	**265**	-9.4%
Comanche (fps)	53.6	**59.82**	-10.4%

Best scores are bolded. We used our standard Athlon 64 FX-51 test bed with an ATI Radeon 9800 Pro (Cat 4.9 drivers), an ASUS SK8N using the nForce3 150 chipset, a Western Digital 2500JB, and 1GB of Corsair Micro.

MAXIMUM PC VERDICT 7

+ STRAWBERRY JAM

Good value, integrated control panel.

– TOE JAM

Eats CPU cycles.

$70, www.philips.com

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Keyboard Catfight

It's a hair-pulling, arm-biting battle: Backlights vs. Bluetooth!

A good keyboard keeps your hands healthy and strong, prevents injury, and makes your computing life easier with added functionality. Choose the wrong keyboard, and besides permanently crippling yourself, you'll find yourself frustrated and far less productive. We put the Microsoft Bluetooth Optical Desktop Elite for Bluetooth and the Saitek Gaming Keyboard under the *Maximum PC* microscope to find out if either is worthy of a place on your desktop.

—WILL SMITH

Saitek Gaming Keyboard

At first glance, we thought Saitek's keyboard might be awkward, even painful, to use. But its flat, low-profile design proved surprisingly comfortable, even during extended gaming sessions. And we love that Saitek doesn't use trap F-keys—the type found in Microsoft and Logitech designs, which don't function as F-keys unless you press a special button.

MAXIMUM PC KICK ASS PRODUCT

Two of the keyboard's features stood out during our relentless gaming and general usage tests. The blue backlight behind every key is outstanding for late-night sessions—you can even adjust the brightness of the backlight or turn it off completely. That's a pretty cool trick, but the programmable nine-button keypad is even more impressive. Using the included software, you can create macros to perform all sorts of frequently repeated actions. Whether it's a "buy" macro for *Counter-Strike: Source* or a "tradeskill" macro in your favorite MMORPG, we likey!

The Saitek Gaming Keyboard comes with a programmable macro pad that lets you run up to 27 different macros for your favorite games—or more boring productivity apps.

MAXIMUM PC VERDICT 9

+ BLUE BACKLIGHT

Nifty macro pad can give you super powers with the right configs.

– BLUE-LIGHT SPECIAL

We wish the macro pad was a stand-alone device, and not tied to the keyboard.

$60, www.saitek.com

Microsoft Optical Desktop Elite for Bluetooth

This latest Bluetooth wireless keyboard and mouse combo corrects many of the problems we had with Microsoft's initial Bluetooth desktop. For starters, the Bluetooth adapter that comes with this set is a fully functional receiver. That means it's able to communicate with cell phones, printers, and PDAs. The keyboard uses a standard layout, plus 19 extra programmable keys. Like other Microsoft keyboards, these extra keys can be programmed to do almost anything, such as starting apps, opening folders, and controlling media applications.

This Microsoft Optical Desktop Elite keyboard/mouse set features full-fledged Bluetooth support.

We have two minor gripes with this keyboard. It still uses the unforgivable F-lock feature mentioned in the review above, and the delete and insert keys are in unconventional locations.

The mouse is a mixed bag as well. It shares the same basic design as the Wireless Intellimouse Explorer, and even includes the new tilting, smooth-scrolling wheel. Unfortunately, although the smooth scrolling of this mouse feels awesome for desktop apps, it's too sensitive in games. We didn't experience this problem with the Intellimouse Explorer 4.0, so we hope a software fix will correct it down the road. Another concern: Battery life was significantly shorter than we like; and for a mouse that uses standard AA batteries rather than rechargeables, that's a problem.

MAXIMUM PC VERDICT 8

+ BLUETOOTH

Comes with a Bluetooth adapter that works the way Bluetooth adapters should.

– BLUEBEARD

The mouse wheel sensitivity is a problem, and we are concerned about mouse battery life.

$150, www.microsoft.com/hardware

Events and Promotions

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www.maximumpc.com/emailnews/

The 1st Extra will arrive in March 2005!

MAXIMUM PC

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LCD Largesse

Two 23-inch widescreen LCD monitors give us good reason to clear off our desks

HP's f2304 didn't win our Gear Of The Year award for nothin'.

Even in their off state, 23-inch widescreen LCDs are impressive, dominating the landscape of any desktop and conveying a seemingly endless expanse of possibilities

This month we power up offerings from Sony and Hewlett-Packard to see if the promise (and steep price) pays off. Both have a 23-inch viewable screen, 1920x1200 native resolution, and 0.258mm pixel pitch, but there are some differences. Let's take a look.

—KATHERINE STEVENSON

Sony SDM-P234

Sony's SDM-P234 is the more stylish of the two displays reviewed here, with a super-sleek black chassis, illuminated logo, and touch-sensitive LED control strip along the right side that is completely invisible when not in use. But that's all window dressing, so to speak. It's the screen that really matters and to put it to the test, we ran the *DisplayMate* utility (**www.displaymate.com**). If an LCD screen has a flaw—or even the potential for a flaw—*DisplayMate's* battery of evaluation scripts will find it.

Sony's SDM-P234: Suddenly you can imagine life with just one monitor!

The SDM-P234 results: Aspect ratio was dead-on; screen uniformity appeared solid; color tracking was accurate; dark and light grays were distinguishable against black and white, respectively; and for the most part gray-scale ramps were reproduced in a smooth, contiguous graduation of intensity. Slight artifacting was evident in the most comprehensive of the intensity ramps, where faint kinks and ripples disrupted what should have been 256 distinct shades of gray moving from dark to light. This could be an issue when displaying photographic images and/or matching colors, but the effect was so subtle, it would likely go unnoticed by anyone but a graphics professional.

In everyday use the SDM-P234 looks gorgeous, with bright, even color, 9-point text legibility, and zero glare or reflection. Finally, in what's become de rigueur for our LCD reviews, we took a couple of high-speed laps around the city streets of *Need for Speed: Underground* without spotting any visual abnormalities.

Sony SDM-P234

MAXIMUM PC VERDICT 9

LCD

23-inches of solid LCD splendor! Stylish chassis.

LSD

256-level gray-scale imperfections and limited inputs.

$2,000, www.sony.com

HP f2304

While we were evaluating Sony's monitor, the f2304 was by its side running the exact same *DisplayMate* scripts and real-world content via a DVI splitter box. (It's the preferred method of comparison, but not always possible if the monitors in question have varying resolutions and/or interfaces, in which case we review them individually using the same PC.)

Simply put, it was a vision of spectacular excess—a testament to the fine quality of both models.

Still, *DisplayMate* performance wasn't identical. The f2304 had no problems with the 256-level gray-scale ramp, but it wasn't as good as the SM-P234 at white-level saturation. In other words, super-light grays were hard to resolve against a white background. Otherwise, aspect ratio, screen uniformity, color tracking, and various other nuances *DisplayMate* reveals were up to the standards we expect from a high-end LCD monitor. Similarly, *Need for Speed: Underground* proved the f2304 to be an able gaming display.

Indeed, the f2304 and SDM-P234 are mighty close competitors. In the end, it came down to inputs. In addition to the VGA, DVI, and audio inputs that the SDM-P234 offers, the f2304 includes S-video and Component inputs, as well as built-in speakers. The latter is admittedly of lesser importance, but all told, the f2304 is the more versatile of the two—and our new favorite LCD monitor.

HP f2304

MAXIMUM PC VERDICT 9

LIQUID CRYSTAL

23-inches of solid LCD splendor! Variety of inputs.

CRYSTAL METH

Super-light grays were indistinct from white in *DisplayMate* tests.

$2,100, www.hp.com

SPECS	Sony SDM-P234	HP f2304
Viewable area	23-inch	23-inch
Native resolution	1920 x 1200	1920 x 1200
Pixel pitch	0.258mm	0.258mm
Interface	DVI, VGA	DVI, VGA

How to Care for Your LCD

LCD monitors are a delicate species, so proper care is essential to their longevity. There are three issues you should be mindful of: damaging the glass, damaging the antiglare coating, and damaging the surrounding parts.

In the absence of manufacturer recommendations, the screen should be cleaned with water or 50% isopropyl alcohol, using either a lint-free cloth or a paper towel. Oily fingerprints on an antiglare coating are the hardest to get out. In such instances, an ammonia-based cleaner like Windex is acceptable, but it may damage or discolor the surrounding plastic parts. Never spray the screen directly and immediately wipe up drips.

Never put any pressure on the glass. Besides the risk of breakage, it changes the optical properties of the panel, usually just temporarily, but permanent damage is possible.

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Canon EOS 20D

Performance and speed on a (prosumer) budget

Get some: The EOS 20D lets you snap up to 23 pictures at 5 frames per second. Not many camera's are faster than that.

By fusing Moore's Law and photography, *Maximum PC* has known for a while that every successive generation of digicams is guaranteed to offer far more for far less money. Canon's 20D is living proof of this corollary. The 20D's 8.2-megapixel and 5-frames-per-second performance is outdone by only one other professional camera—which costs three times as much. (See page 15 for another interesting take on Moore's Law and digicams.)

As the name implies, the 20D is a much improved version of the EOS 10D that's been on the market for just shy of a year now. The 10D received high marks when released for its image and build quality, but there were nagging concerns about its auto-focus accuracy and its pokey speed when writing to the memory card. It didn't help that, shortly after the 10D shipped, Nikon introduced the awesome D70, which many considered better and cheaper than the 10D.

The 20D erases most of these issues. The new body uses a high-precision AF module that provides greater accuracy when using lenses of F/2.8 or faster. Canon increased the number of focusing points from seven to nine, and each is noticeably smaller now, so you can more precisely hone in on a specific point. Auto-focus tracking—something the 10D received below-average marks for—has been improved to the level of the company's 1990s-era pro camera, the EOS 1n. In short, it's pretty good, but not outstanding.

We have very few complaints about the 20D's write performance. Even though the camera has a generous 23-frame buffer for JPEGs, the camera writes to high-speed CF so fast you'll rarely wait to take your next picture. Shutter lag—the time between pushing the shutter button and the picture being captured—has also been improved.

In practical use, the magnesium-body 20D feels amazingly responsive and fairly solid. The AF snaps into focus quickly, and focus tracking on moving objects is also faster, although not in the class of today's professional (and much more expensive) cameras.

While the focusing may not be in the same league of the EOS 1D Mk. II, the 5-frames-per-second buffer is. For production cameras, only Nikon's pro-class 4MP D2X and Canon's EOS 1D Mk II offer more fps. Unless you shoot professional sports, we can't imagine why you'd need more.

The imaging sensor is a Canon designed and fabbed APS-C-sized CMOS chip that demonstrates Canon's aptitude and expertise at minimizing image noise, or "grain." Generally, as you increase the pixel count in a sensor, you increase the noise. That's why 5-megapixel point-and-shoot cameras with small sensors generate such grainy images at ISO speeds over 200. Canon is able to keep the noise at amazingly low levels, making ISO 800 and even 1600 quite usable, even top-notch.

One irritating bug that Canon overlooked causes the camera to occasionally lock up when a lens is removed while the camera is asleep. Canon has since corrected the issue with new firmware that can be installed in five minutes, but this never should have made it out of the factory.

So which should you buy: Nikon's D70 or the Canon 20D? The simple answer is that the two cameras don't really compete directly. The D70 gets chewed up by the 20D in many categories, but the 20D costs $500 more. With that said, it's clear that the 20D is at the head of the class in the DSLR category, and we'd gladly fork over the extra bucks for the privilege of using it.

—GORDON MAH UNG

SPECS	
Resolution	8.2 megapixel (3520x2344 pixels)
Lens compatibility	Canon EF and EF-S system
Shutter	30 sec. to 1/8000 (including bulb)
X-sync	1/250
Weight	24.2 ounces (body only)
Continuous shooting	5 fps
Burst rating	23 JPEGS at ISO 100 (6 in RAW mode)
Storage	Type I and II Compact Flash
Auto-focus system	9 AF points at 0.5 to 18 EV
Battery	Li-Ion (good for 500 shots with 50 percent flash)

MAXIMUM PC VERDICT 9

SUMMER

5fps and smooth, beautiful, high-ISO images.

WINTER

Initial firmware bug, and no color meter.

$1,500 (body only), www.canon.com

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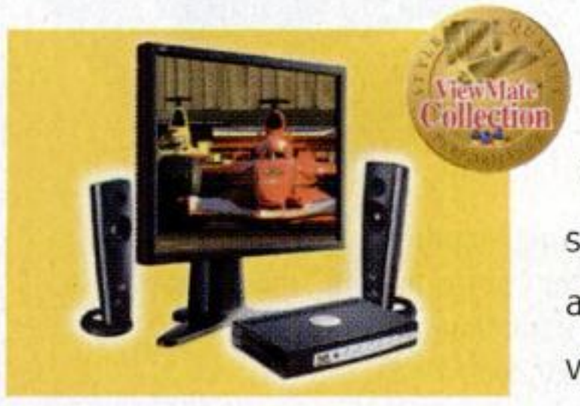

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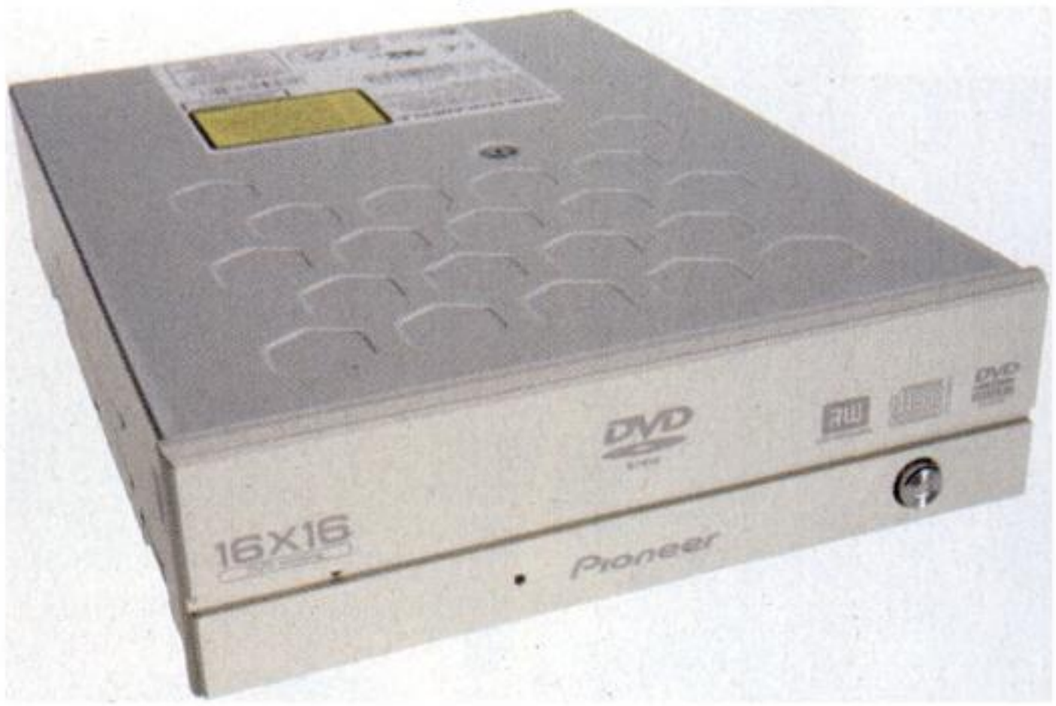
Pioneer DVR-A08

Fastest DVD burner yet—if you can stand its software



The DVR-A08 is furiously fast, but it's expensive, the media is scarce, and the software is nasty. What's the point?

Pioneer's release of the first consumer-level DVD burner using the DVD-R format made a laughingstock of the competing DVD+R format that had been vaporware for years. But in a striking reversal of fortune, DVD-R has lagged months behind the competition in developing a specification for double-layer DVD recording. That spec has finally arrived, and the good news is that Pioneer's DVR-A08 is the first DVD burner to hit 4x with certain brands of existing DVD+R DL discs. (Unfortunately, DVD-R DL discs were unavailable at press time.)

We slipped a DVD+R DL disc from Verbatim into the DVR-A08, and wrote 8.3GB in a record-breaking time of 27:04 (min:sec). That's more than a quarter-hour faster than any other DVD burner we've tested. But we can't say we were euphoric about the achievement. We received only two pieces of media for testing, and the bundled disc mastering app crashed during tests with both discs. When we contacted Pioneer for more double-layer media, an epic struggle to find a *single disc* ensued. The lesson here is clear: Before you're seduced into buying any optical drive, make sure you check the availability—and the price—of compatible media.

Another lesson is to avoid the sinister suite of applications bundled with the DVR-A08. After an interminable installation routine that flung a number of error messages at us, we struggled to find the basic disc mastering application in our Start menu, which turned out to be called *Ulead MovieFactory 3.5 SE*. It's a sluggish beast, often taking several seconds to respond to menu selections. As we mentioned, initial attempts to burn a double-layer disc were unsuccessful. We were able to burn to a DVD+R disc at 16x speed without any problems, completing the task in 7:29—a single second slower than the Memorex 16x DVD burner we reviewed last month. But we encountered more problems in CD burning tests. *MovieFactory* insisted our traditional test folder was too large for the disc's capacity, but the application window doesn't display file size information or even support right-clicking a file for property information, which would have helped us trim the contents.

We're delighted about Pioneer's technical achievement with the DVR-A08. We hope some day we'll be able to say the same about the media, the price, and the software.

—LOGAN DECKER

MAXIMUM PC VERDICT 7

+ THE MAN WHO WASN'T THERE

Extremely fast double-layer burning. Quiet even at maximum speeds.

– THE MEDIA THAT WASN'T THERE

The paucity of discs does not bode well for this format. Horrible software.

$190, www.pioneerelectronics.com

Maxtor One Touch II

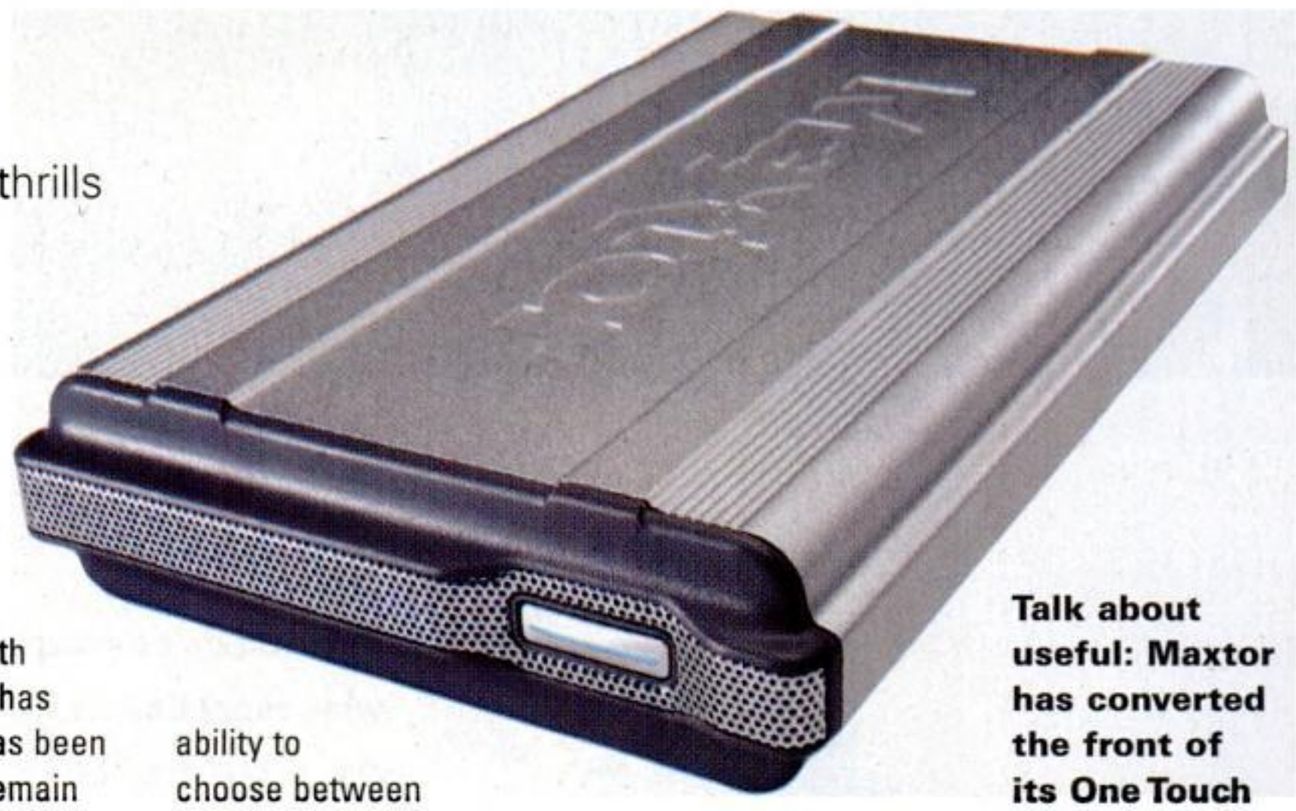
Bigger, better, faster—this backup drive gives us thrills *and* frills

We reviewed the Maxtor One Touch backup drive in May, and bestowed it with a 9 verdict for its superb performance, despite a somewhat frill-less package. Undaunted, Maxtor has fired back with a totally revamped "solution" that injects a few extras missing in the first version.

For starters, Maxtor upgraded the new, improved One Touch with its top-shelf 7,200rpm Diamond Max 10 drive. As a result, capacity has increased from 250GB to a generous 300GB, and onboard cache has been doubled to 16MB. That's good news indeed. Connectivity options remain the same, including one USB 2.0 port and two FireWire ports on the rear of the aluminum outer shell, which are intended to daisy-chain a device off the One Touch. We wish there were an extra USB port on the back—or front—as well.

While we welcome the hardware upgrade, the *real* upgrade lies in the device's software. While it still uses Dantz *Retrospect Express*, Maxtor has added a slick front-end interface that takes any guesswork out of the process and makes it much easier to manage. Even the greenest newbie could use this software, as could your average Mac user (well, probably).

Maxtor added a few new features to the software as well. Our favorite is the ability to password-protect the One Touch. You can also create historical backups, making it possible to restore individual files from a particular day. Lab tests revealed that both of these features work flawlessly, as did every other aspect of the drive. Another cool new feature is the ability to choose between a very quiet "normal" mode, or a slightly louder "performance" mode that offers improved seek times.



Talk about useful: Maxtor has converted the front of its One Touch drive into an electric razor.

In the final tally, we're impressed with the steps Maxtor took to significantly improve what was already a great product. If it had a media reader and USB hub—like the Western Digital Media Center—it would undoubtedly receive a perfect 10.

—JOSH NOREM

MAXIMUM PC VERDICT 9

+ DIAMONDMAX

Best backup software ever, huge capacity, and quiet.

– ZIRCONIAMAX

Unlike the WD competition, it lacks a media reader and USB hub.

$380 ($330 for 250GB), www.maxtor.com

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For Your Gawking and General Amazement

THE 2005 Maximum PC Dream Machine Tour

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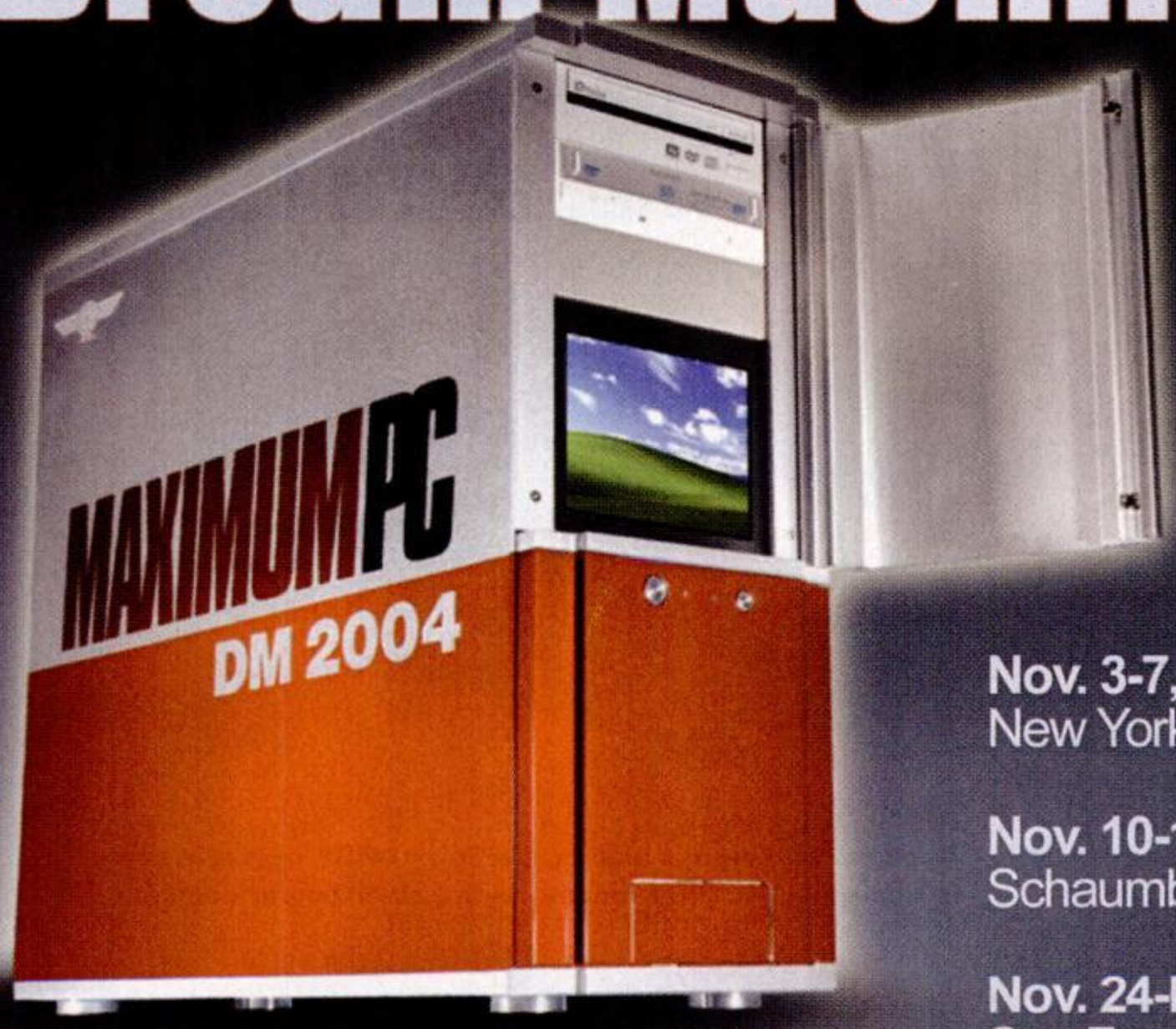

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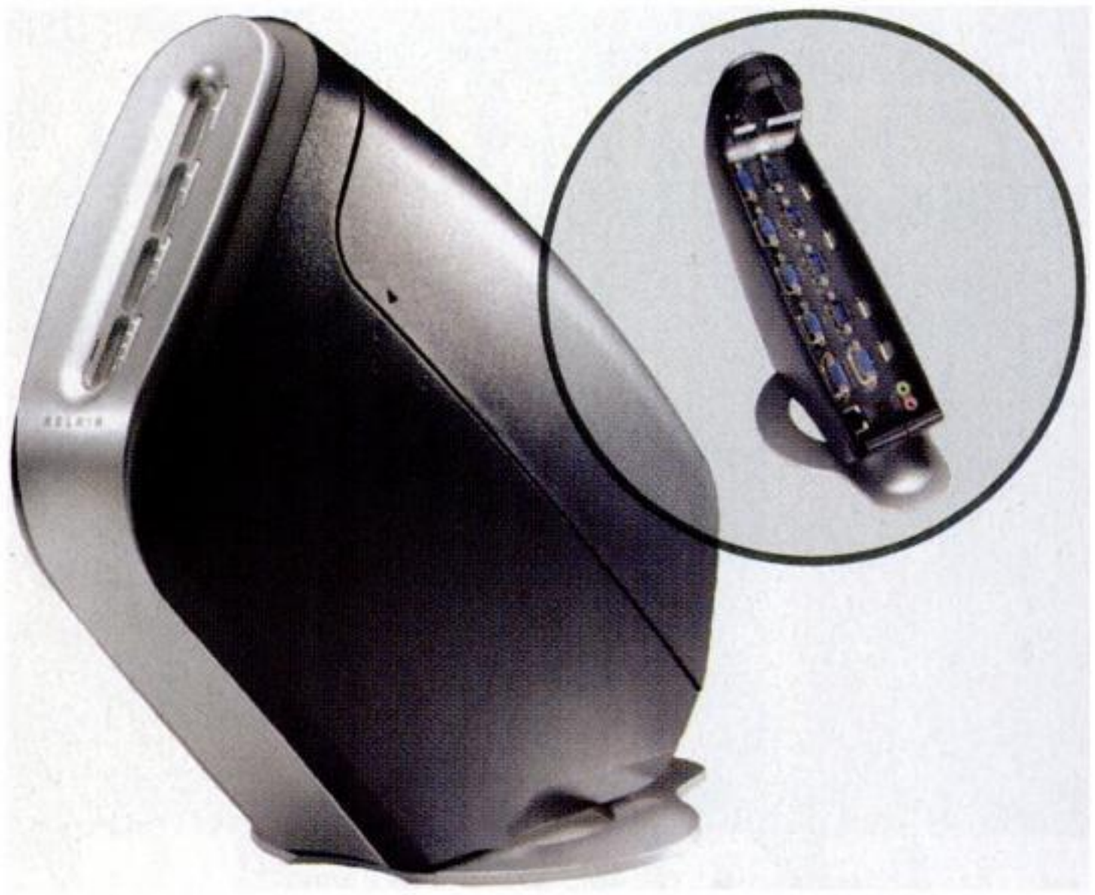
OmniView Dual-Head KVM

Belkin delivers the first multi-monitor KVM, but is it worth the price?



This new Belkin KVM lets you connect multiple rigs to a pair of monitors, a keyboard, and mouse.

You love your dual-monitor rig, with good reason. It gives you twice as much desktop room as a single display, and your productivity has increased accordingly. But until now, there hasn't been a practical solution for someone who wants to share a pair of analog monitors, a keyboard, and a mouse with more than one PC. Using the latest OmniView KVM switch from Belkin, you can do just that.

The Belkin KVM uses a proprietary cable to carry both analog VGA signals, the USB keyboard and mouse signals, and both the speaker output and microphone input signals to each PC from the unit. On the PC side, everything connects just like normal, but on the KVM side, you need only plug in a pair of VGA-like cables. This was necessary to minimize the size of the KVM—connecting 25 wires to a small box would be unwieldy at best—but it does mean you're forced to use Belkin's cables, which are expensive. In fact, a relatively short six-foot cable costs a whopping $80!

Image quality and response time are indistinguishable from a normal rig. Unlike earlier Belkin KVMs, this latest model has no problem whatsoever delivering repeating signals from the keyboard. (When you hold down a key, a signal is repeatedly sent from your keyboard to the computer. This allows you to use your keys for things like movement in a first-person shooter.)

We have two main complaints with the Dual-View KVM: its high price and its inability to handle DVI monitors. The single VGA counterpart to this router costs about $280 for the KVM and cables for four computers, but the dual-head KVM costs a whopping $645! For the difference in price, we'll just use a single-head KVM and relegate the dual-monitor setup to our primary machine.

As for the lack of DVI connections, even most *Maximum PC* editors have only one analog display, preferring a more svelte LCD flat-panel as their second monitor. And no one wants to connect an expensive DVI flat panel to a non-native analog connection.

—WILL SMITH

MAXIMUM PC VERDICT 7

DARTH VADER

It works as advertised, with no control lag or image corruption.

ANAKIN SKYWALKER

Proprietary cables raise the costs of KVMing to near ludicrous levels.

$325 (+ $80 per computer cable), www.belkin.com

LaCie 100GB Mobile Hard Drive

A big, bold drive that is really, really small

Besides the elegant design, LaCie's 100GB portable drive is bus-powered. That means no ungainly power cables.

As soon as we received the LaCie 100GB Mobile drive, the staffer who opened the package held it aloft like a newly unearthed gem and proudly proclaimed to those nearby, "Check *this* out!" As everyone gathered around to admire its sleek, clean design, someone asked, "How big is it?" to which the staffer replied, "100GB." At this point, even the art staff spun around in their chairs. Sure, they're Mac users, but they can use the LaCie Mobile drive just like us.

Indeed, we were all drooling. Not only is this the sexiest bus-powered hard drive we've ever tested, but also the highest capacity. Its exterior was designed by F.A. Porsche—a design company where we're sure the CEO wears a black turtleneck to work each day. The drive's rear end has both a USB 1.1/2.0 port as well as a standard six-pin FireWire port, which means it doesn't need any more power than what the USB and FireWire ports provide. (Smaller four-pin FireWire ports require external power, but not the six-pin port). In the unfortunate event of a power shortage, an auxiliary power cable is provided, as are FireWire and USB cables.

Because large capacity, bus-powered drives often can't receive enough juice from a single USB or FireWire port, we tested the drive's power capabilities by plugging it into numerous USB ports—both front- and rear-mounted—on numerous PCs and laptops as well as USB hubs. We only experienced connection problems once: when we connected the drive to a USB extension cable that was several feet long. In every other instance, the drive was recognized immediately and worked like a champ.

There is no bundled software package, but the LaCie Mobile doesn't need one to operate. This means that if you want to use it as a backup drive—and its 100GB capacity certainly allows it to function as such—you'll have to find software on your own. (We recommend *SyncBack*, **www.2brightsparks.com**.)

The only kicker is that LaCie's drive operates at 4,200rpm drive. But during testing it delivered transfer speeds of approximately 20MB per second (FireWire was a tick faster than USB), which is just as fast as the 7,200rpm USB drives we've tested.

—JOSH NOREM

MAXIMUM PC VERDICT 9

BUS-POWERED DRIVE

Huge capacity, quiet operation, FireWire and USB ports.

BUS-POWERED DATE

Only 4,200rpm.

$370, www.lacie.com

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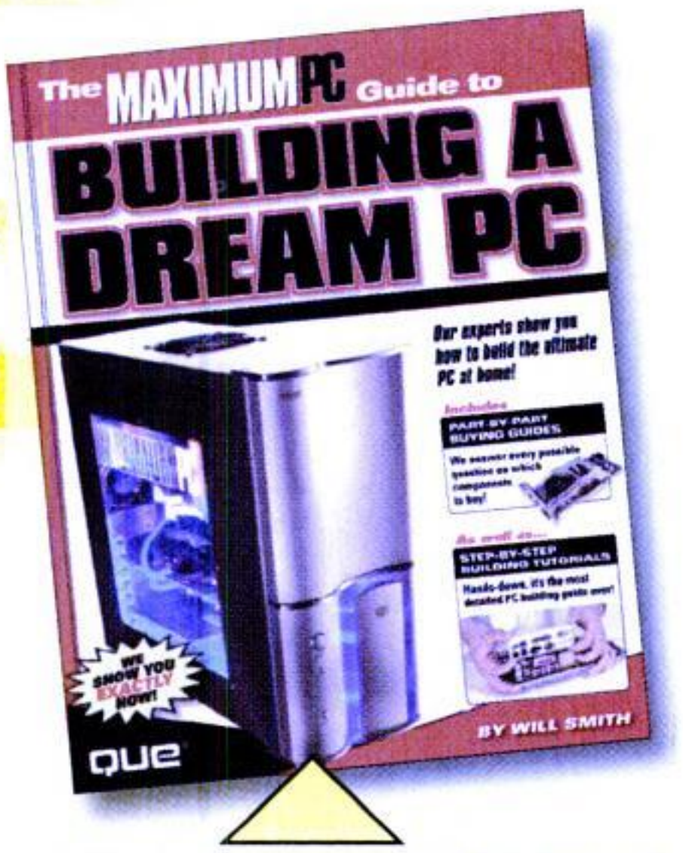

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Maximum PC Guide to Building a Dream PC

It's the biggest, meanest, *most complete* PC building guide we've ever created! Not only do we show first-time PC builders *everything* they need to know about assembling a computer from scratch, we also divulge the truth behind competing hardware technologies, and show you how to make the smartest parts choices. Includes configuration plans for six different Dream Machine archetypes. *By Will Smith, technical editor*

- **$29.99, ISBN 0-7897-3193-2**

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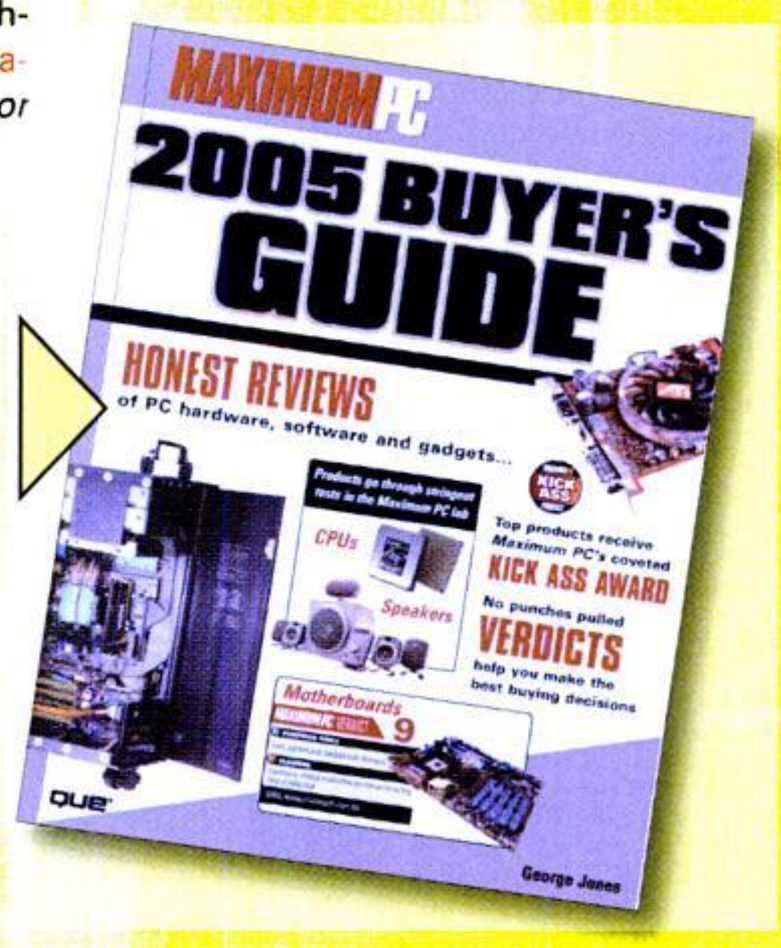
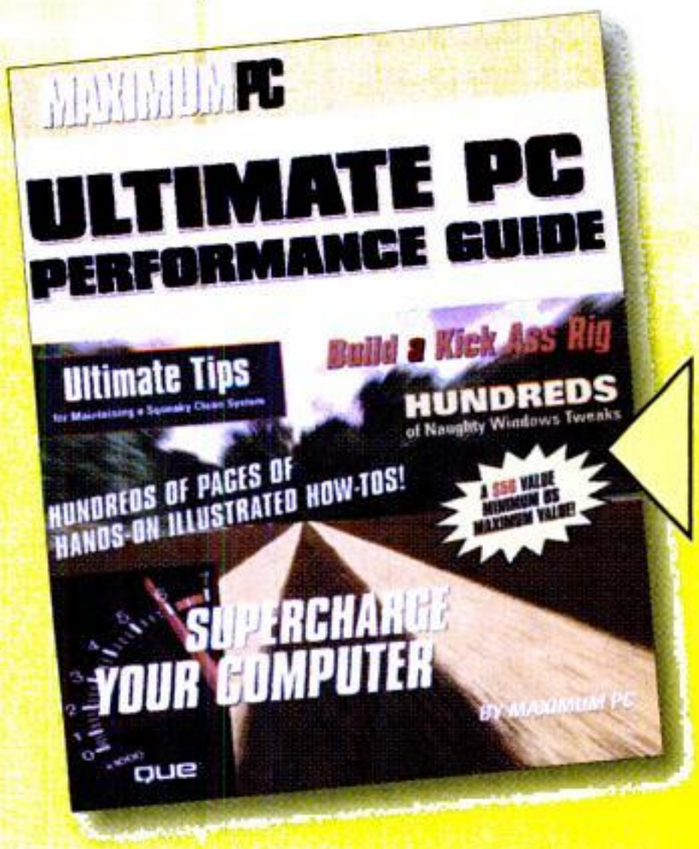
Get an insider's peek at 2004's most exciting Lab experiments, plus forward looks at the gear you *must* know about in 2005. Includes the hidden story behind *Maximum PC* benchmarking, and a full compendium of our most positive—and brutal—2004 product reviews. Special Ask the Doctor and Watchdog wrap-ups make this a veritable *Maximum PC* almanac! A must-have reference book for faithful readers of the magazine. *By George Jones, editor-in-chief*

- **$29.99, ISBN 0-7897-3194-0**





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Omnifi Digital Media Player

Enjoy your music digitally at home—and on the road!

Rockford's Mobile Digital Media Player (DMP-1) and home Digital Media Streamer (DMS-1) allow you to rip your entire CD collection, store it on your PC, and then listen to it anywhere in your home—and on the road.

The DMP-1 consists of four parts: A removable controller faceplate with a large LED display, a removable 20GB hard drive that can store up to 4,000 songs, a hard-drive housing , and *SimpleCenter*, the proprietary software that drives the system.

Installing the system is similar to installing a CD-changer. If you opt for professional installation, it will cost around $200 in parts and labor. Whatever the case, make sure the DMP-1 is connected to your car's sound system via direct input rather than an FM-modulator, which will generate inferior sound quality. You can also install an optional wireless adapter ($50), which will let you automatically update the unit with new music when your car is parked within Wi-Fi range, like in your garage.

Your ripped music is transferred from your PC to the DMP-1 hard drive via USB 2.0. Once done, insert the drive into the DMP-1 housing installed in our car, and off you go. We love the drive's rugged construction, which is meant to handle the bumps and bounces of regular transport. Heat, however, is another matter. We mounted the housing in the trunk of a black sedan that resides in lovely Rocklin, CA—known for its brutally hot summers—and found that if we left the car in direct sunlight for more than an hour or two without removing the drive, it routinely overheated and refused to play. Ideally—and the product literature states this—you should mount the housing in the car's air-conditioned interior, but we're concerned it might still have problems inside the car on a hot day—at least until the AC cools everything down.

We found the DMP-1's controller to feel a bit flimsy, and it didn't fit as snugly as we'd like in its mounting bracket. Furthermore, the controls are small and crowded together, which can make it awkward to use while driving. This is a cardinal sin in a device meant primarily for use in a car!

The *SimpleCenter* software gives you an easy way to transfer songs and playlists to the DMP-1. You can even use it to rip your CDs in either WMA or MP3 format, although the ripping options are anemic compared with most other audio software. We tested loads of music, and everything we threw at it—Metallica, U2, Led Zeppelin, The Who, Yanni—sounded stellar at high bitrates.

The DMP-1 mobile digital-audio system consists of a hard drive housing (top image), a 20GB drive (middle image), and a faceplate (lower-left image).

Unfortunately, the software has a few bugs that bog things down, such as failing to update via the built-in update options, and failing to flag bad rips (due to dirty or scratched media), which can result in some ear-assailing belches in the car.

Omnifi's DMS-1 is a single device that performs exactly like the DMP-1, for use in the home.

While certainly annoying, the unwieldy interface and assorted minor flaws of the DMP-1 aren't bad enough to make us go back to the alternative. Goodbye, CD-changer, we won't miss you!

—STEVE KLETT

MAXIMUM PC VERDICT 7

+ IN THE FAST LANE

Rugged and able to store a ton of songs. Makes CDs in the car passé.

– STUCK IN THE MUD

Heat sensitive, small controls, software bugs.

$350, www.omnifimedia.com

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Dawn of War's **units and landscapes are among the best looking in any game we've ever seen—perfect for showing off your power rig. The game also includes a custom painting tool for your units.**

Warhammer 40,000: Dawn of War

Finally—a real-time strategy game that doesn't feel like a real-time strategy game!

Lately each new real-time strategy game has been, well, just a new real-time strategy game. Build, gather, rush, lather, rinse, repeat. Snore. There was no reason to think another RTS, or even another adaptation of the revered Warhammer miniature game system would stray at all from that formula. Enter Relic Entertainment. Rapidly becoming one the premier RTS developers in the world, these Vancouver designers have rejuvenated a stale genre with *Dawn of War.*

Relic flawlessly executes the essence of the Warhammer system, which relies on combined squad actions, with one squad supporting another in a movement/overwatch relationship. This gameplay philosophy is a refreshing departure for the real-time strategy genre, because it discourages massive unit buildups by emphasizing small squads. It also allows the replacement of soldiers who are killed, effective and unique unit upgrades, and leadership benefits. Early in the game you learn that nurturing a small assortment of squads is far more effective and satisfying than building a mass of disposable units.

Another key to the more subtle tactics of *Dawn of War* is the way control points are implemented. Each point must be captured by a squad, but this takes time, during which the squad is completely vulnerable. Attempting to grab a series of points without proper combined forces simply won't work, so squads need to work together.

All of these elements are made all the more effective by the depth of the *Warhammer 40,000* world, which pits Space Marines, Orks, Dark Marines, and Eldar against each other in a feudal, sci-fi setting. Games Workshop has spent years building depth into the characters, units, weapons, faction histories, races, and stories of this universe, and much of it emerges here. The campaign mission is lamentably short, but packs in a good story, some eye-popping cinematics, and unusually strong voice acting.

Visually, the game is top-notch, allowing both a long distance perspective for a solid tactical overview of the battlefield, and tight ground level views of the action.

Dawn of War's main failing is the shortness of its solo game. A full and satisfying multiplayer component makes up for this—kind of—but the shortage of maps needs to be remedied. Beyond this, there are few negatives. Not only is it a satisfying rendering of the Warhammer system and universe, it's also a ripping-good RTS.

—THOMAS L. MCDONALD

MAXIMUM PC VERDICT 9

+ ORKS

Terrific implementation of Warhammer rules, requiring more subtle tactical decisions than many RTS games offer.

– ORCS

The campaign game is short and slow to introduce the good gear.

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Rome: Total War

Truly, this is the glory that is Rome

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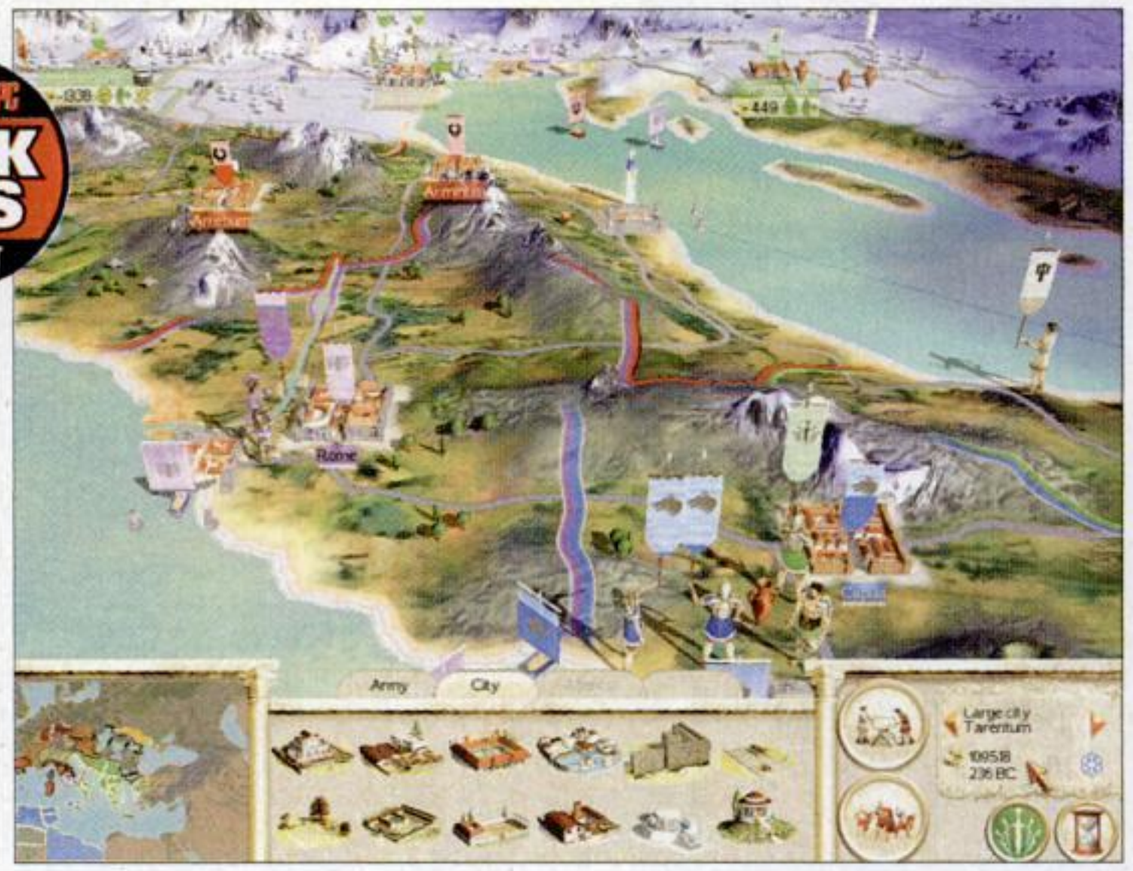

In *Rome: Total War*, the strategic aspect of the game is turn-based and plays out on a large map of Italy and the surrounding regions.

The hallmark of Creative Assembly's *Total War* series is an almost effortless blend of high-level strategy and ground-level tactics: two gameplay styles that can often be at odds. *Rome* alternates sweeping, turn-based decisions centered on long-term cause/effect relationships among taxes, citizen happiness, construction, trade, and **diplomacy with real-time armchair general decisions focused on** troop **deployments, support, and maneuvering.**

The game's pacing is just right, giving you plenty of time to play out the intrigues and empire-building of ancient Rome during the age of the Caesars, as well as conduct the most impressive city-sieges and battles ever brought to a computer.

Sieges are handled cleverly, allowing you to overwhelm a city on the strategic map and simply starve it out without fighting a single battle, or build siege equipment and hit the 3D battlefield in real time. Once you deploy the deliciously rendered foot soldiers, cavalry, archers (with flaming arrows!), catapults, battering rams, siege towers, and (our favorite) tunnel diggers, you're in an entirely different game. It's not like dropping to *Command & Conquer* during a game of *Civilization*. It's a wholly unique experience: two games that could easily stand on their own, merged into a fluid whole.

Technically, the game is a giant leap forward from *Medieval*, with more units on the field—each unit is an individual 3D model!—and more detail, all of it maintaining surprisingly high frame rates. The package is almost absurdly feature-rich. There are numerous maps, customization features, victory types, factions, and multiplayer support en masse. The campaign games are long and satisfying, with political power struggles culminating in that final march to Rome itself.

—THOMAS L. MCDONALD

MAXIMUM PC VERDICT 10

+ TOTAL WAR

Brilliant, deep blend of turn-based strategy and real-time tactics.

– LIMITED WAR

What's to complain about?

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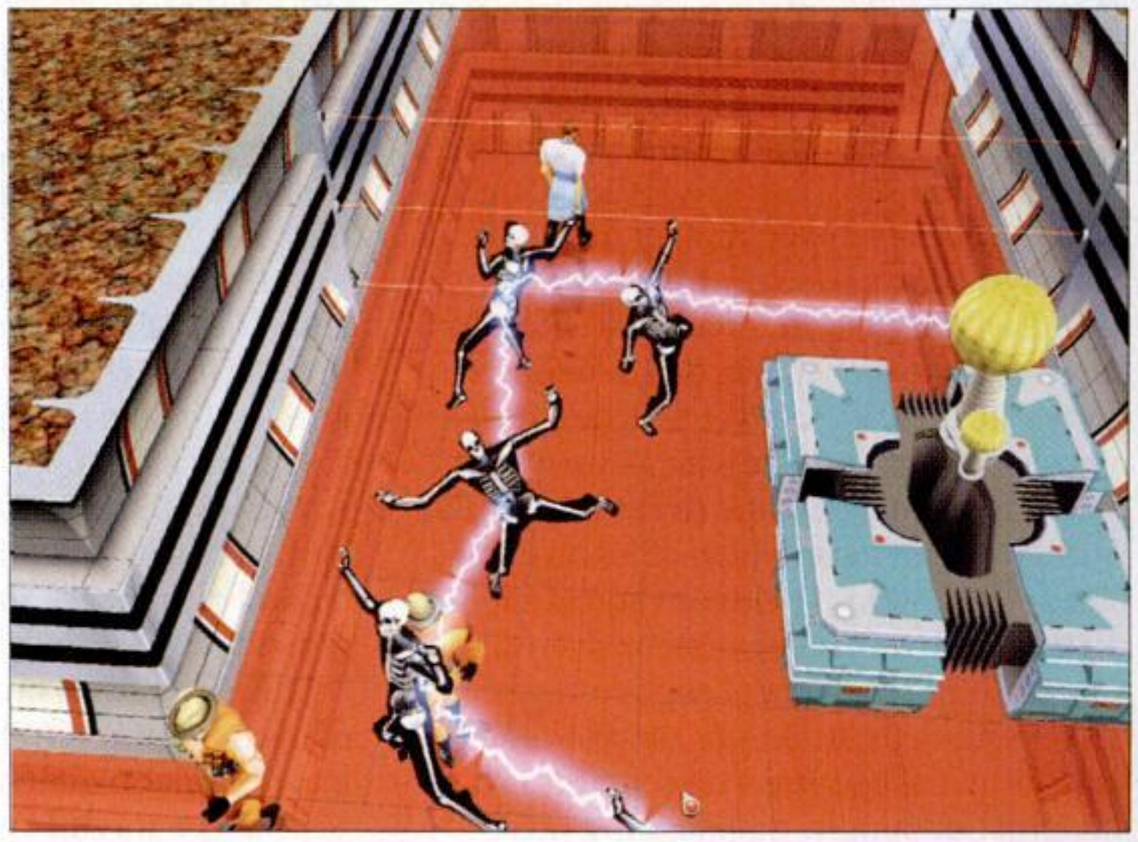
Evil Genius

Welcome to your evil underground lair!



Call us sickies, but the only way to prove your evil abilities is to build overly complex booby traps that electrocute hordes of enemies!

In *Evil Genius*, you are Dr. Evil. You lead a massive, world-wide, evil organization whose only goal is to take over the world. At your beck and call are more than a dozen varieties of evil underlings, ranging from relatively innocuous workers to slippery spin doctors to insidious biochemists. Like any true evil genius—from Ernst Stavro Blofeld to Hugo Drax to C. Montgomery Burns—you issue orders, but keep your hands clean of the messy day-to-day work.

Evil Genius may initially seem like your garden-variety lair-building *Dungeon Keeper* clone, but there's much more to it. In addition to building your lair and staffing it with a multicultural force of minions, you must also send teams of goons out into the world to do your bidding. Their goals range from the basics—such as stealing cash and loot—to kooky world-domination schemes that will warm the heart of every wannabe overlord. In order to succeed, you must balance the daily needs of your base and your megalomaniacal urges to take over the world, all while building your reputation as the world's premiere supervillain. Overextend your forces, and you'll find yourself with a base full of turncoat super-spies.

Of course, you really don't have to conquer the world to be a successful evil genius. The first time you slaughter a dozen do-gooders in an unnecessarily complex trap, it makes all the late nights spent slaving away at your schemes worthwhile.

—WILL SMITH

Flambe anyone that stands in your way of becoming the world's next top supervillain.

MAXIMUM PC VERDICT 9

+ SKULL-SHAPED ISLANDS

Innovative campaign mode, loads of kooky traps, torture devices, and other items.

– HEART-SHAPED ISLANDS

When things go wrong, you can execute underperforming minions. Oh wait, that's not a bad thing.

$50, www.evilgeniusgame.com

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Call of Duty: United Offensive

More of the same, but still tasty

What's the fastest way to take out three Tigers? Call in the Airedales!

If you're looking for a deeper, more cerebral first-person shooter, this *Call of Duty* expansion is not it. But if you're looking for more white-knuckle WWII shooter action, *United Offensive* delivers it in droves, with 13 new missions and about 10 hours of single-player gameplay. We consider it a must-have expansion.

Three separate mini-campaigns follow American, English, and Russian soldiers through the war's largest conflicts, such as Kharkov and the Battle of the Bulge. The expansion pack also offers a few new weapons, including a portable chain-fed .30 caliber machine gun. Indeed, Grey Matter, the game's developer, has delivered a completely satisfying experience that's enjoyably similar to the original game.

But that's not all. Multiplayer features an additional 11 new maps, drivable vehicles, and three new game modes. Our favorite is the new Base Assault mode. We love the way the game doles out more advanced weapons and skills to you as your kill count and time played increase. This means better players gain access to smoke grenades, satchel charges, and even artillery strikes. Not only does this help keep clueless n00bs from calling in artillery on your own team, it also promotes "good" behavior—too many team kills stops your advancement.

—WILL SMITH

MAXIMUM PC VERDICT 8

+ COMMUNISTS

Loads of new content and weapons, and the vehicles rock!

– FASCISTS

Domination mode seems a lot like *Battlefield: 1942.*

$30, www.callofduty.com

Star Wars: Battlefront

Not the worst Star Wars game ever, but far from the best

Killing Stormtroopers by the squad certainly sounds exciting; sadly, the abysmal AI takes most of the fun out of it.

There are two basic problems with *Star Wars: Battlefront.* First, it's extremely difficult to find good servers online. Second, the bot AI is unforgivably bad, which is especially tragic because bots infest nearly every multiplayer server on the net. It makes us sad, because the concept of a *Battlefield: 1942*-style multiplayer shooter set in the Star Wars universe had us all tingly inside. And now our tingly feeling has nowhere to go.

Because the bots are ubiquitous, their behavioral problems are more than a single-player annoyance. Even more frustrating is that the bots don't always behave like complete morons. Frequently they exhibit intelligent behavior—they're aware of cover fire, use cover intelligently, and even reinforce the right areas. However, in one-on-one or even many-on-one situations, they're easier to kill than baby seals. When you put them in a vehicle, it only gets worse. Get used to seeing bots aimlessly running into corners, on foot and in vehicles.

The server browser is also bad. For a game that's designed to be played online, it's inexcusable. The only way to determine your ping to a particular server is to click on the server. With 1,500 servers running at any given time, this is a most frustrating proposition. Even if you do luck out and find a full server with a low ping, odds are that 18 out of 30 players will be the intermittently retarded bots. Boo, hiss! We're praying for a comprehensive patch to this one.

—WILL SMITH

MAXIMUM PC VERDICT 5

+ THE EMPIRE

Despite its flaws, Battlefront can still be fun on a good server.

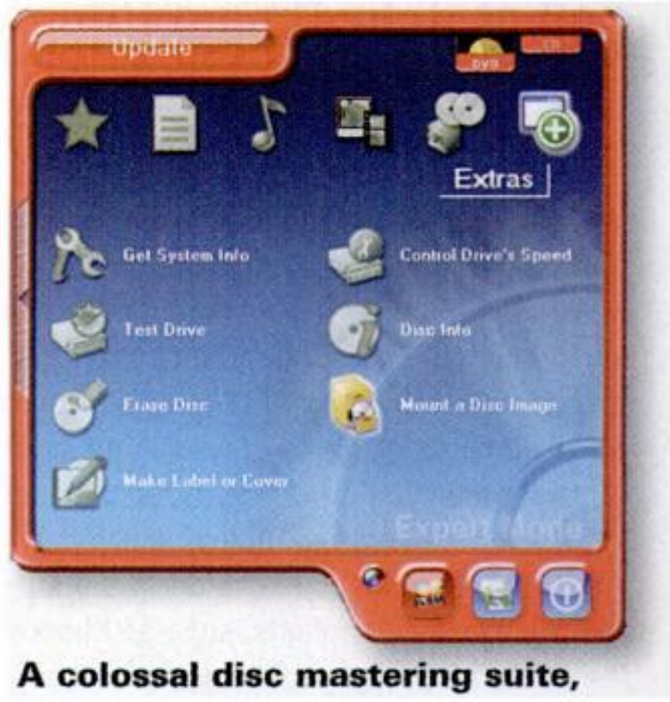
– THE TRADE FEDERATION

The bots are dumb, it's hard to find a good server, and who the hell wants to play as the Trade Federation?

$50, www.lucasarts.com

Nero 6.6 Ultra Edition Reloaded

A massive new version of the disc mastering suite packs in all features—great and small



A colossal disc mastering suite, *Nero 6.6 Ultra Edition Reloaded* buffs up with a smarter interface, improved DVD authoring, and oodles of sound editing tools.

More than a year after suffering a devastating KO at the hands of Roxio's *Easy CD Creator 6*, Ahead is back in the ring with the disc mastering suite we had expected from the initial release of *Nero 6*. Like *Easy CD Creator 6*, *Nero 6.6* is a wildly comprehensive suite of applications and utilities—15 of them, in fact—capable of a wide array of tasks, including data backup, Video CD creation, audio disc mastering, and DVD-Video construction.

The heart of the system, naturally, is the burning engine. We hesitate to get misty-eyed over a requisite like basic software stability, but after the horribly buggy initial *Nero 6* release, we were relieved to not experience a single crash or so much as a hiccup throughout our tests of *Nero 6.6*, even though we regularly rode it hard and put it away wet. This is particularly reassuring now that we're dealing with tasks that involve expensive single- and double-layer recordable DVD media.

Even better, Ahead continues its tradition of fine-tuning the engine and expanding its capabilities. *Nero 6.6*, for example, now offers the option of setting the "book type" for certain kinds of media. Also known as "bit-setting," setting the book type to DVD-ROM may increase compatibility with certain set-top DVD players. Even if it doesn't work with your DVD player, this feature certainly doesn't hurt.

We appreciate the streamlined, gimmick-free interface provided by *Easy CD Creator 6*, but Ahead one-up's Roxio with a mature "SmartStart" front-end that neatly displays common burning tasks. This front-end can also be customized to display other modules you'd prefer to see. Of course, you can still launch *Nero* through the traditional application interface, which we prefer.

The *Nero Vision Express* module, now at version 3, whisks you through the process of authoring your own DVDs quickly and efficiently. It supports animated backgrounds and video buttons for menus, and transcodes DivX, Xvid, and WMV files to MPEG-2. We found it odd, however, that while you can adjust such minutia as the direction of the light source on shadowed text, you can't import your own button frames or other menu assets made in *Photoshop*.

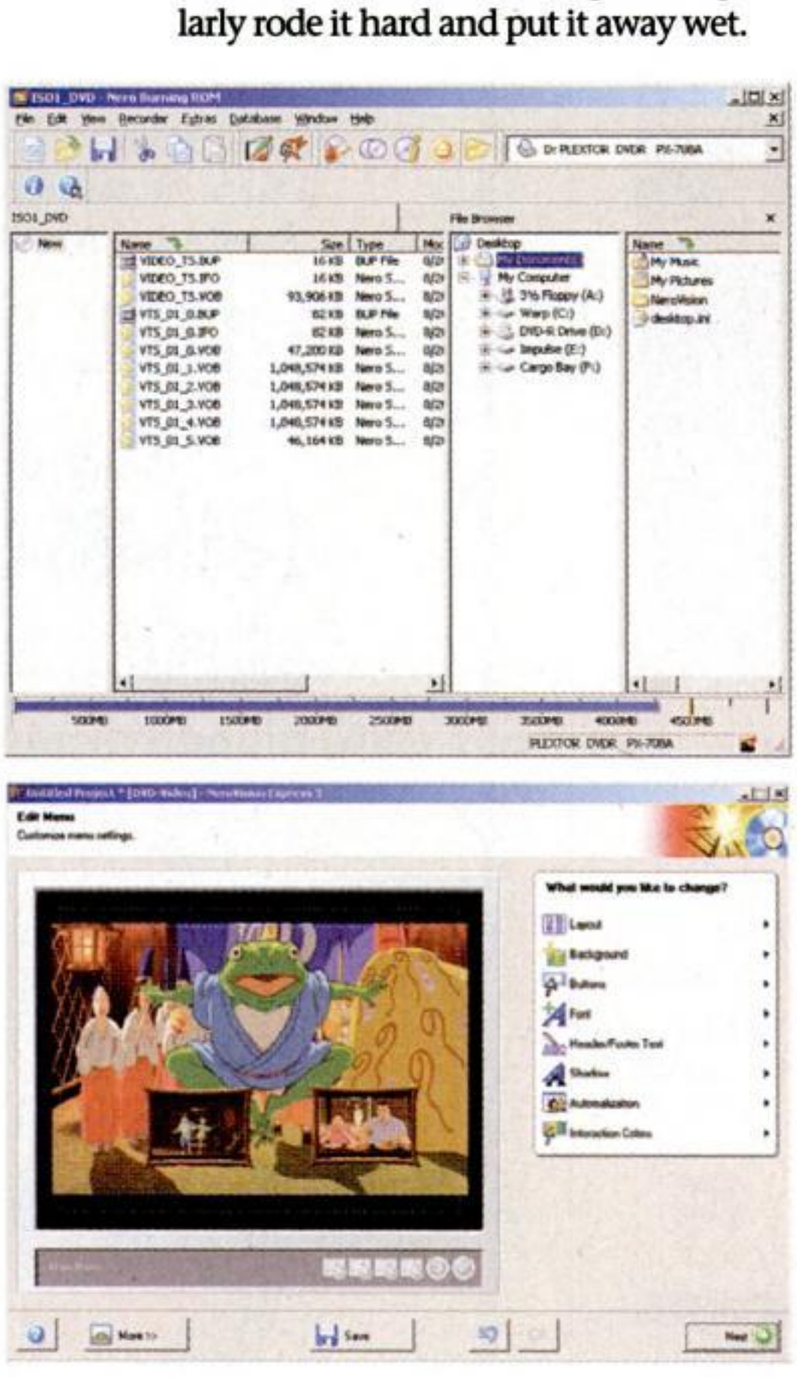
Nero Vision Express 3 also lets you copy (non-protected) DVD-Video discs, and can even squeeze the contents of a double-layer disc to fit onto single-layer media in just over 12 minutes! You have complete control over this process—you can delete extra disc features and foreign language tracks you don't need, and then specify the amount of compression to apply to the remaining portions of the disc. NVE3 also lets you juggle compression ratios while keeping the overall file size below a specified maximum—exactly the kind of background administrative work we expect software to perform.

Another module called *Nero Recode* compresses video using a proprietary codec based on the MPEG-4 standard, which Ahead is pushing hard to have widely adopted in consumer electronics. As fast and sharp-looking as this codec is, we simply do not see a pressing need for yet another codec.

Nero 6.6 offers more audio disc mastering and sound editing features than *Easy CD Creator 6*, but these features—from simple drag-and-drop crossfading to support for professional VST audio effects—are distributed throughout several different applications that aren't well integrated. As an example, while we could easily create a mix audio CD with elegant crossfades in *SoundTrax*, we couldn't normalize the volume among the tracks within the same application. Sadly, the *SoundTrax* "documentation" is little more than an incomplete summary of the modules capabilities.

We'd still recommend *Easy CD Creator 6* if you want a more sophisticated video-editing application than the one offered in *Nero 6.6 Ultra Edition Reloaded*, but we think most power users will be better off with *Nero*. The suite is a phenomenal value for the price, nailing the essentials of disc mastering with honors, and developing secondary features that approach the scope of full-fledged applications.

—LOGAN DECKER



Longtime users will recognize the traditional *Nero Burning ROM* interface (top); beginners and experts will find much to appreciate in the *Nero Vision Express* DVD-Video creation wizard (bottom).

MAXIMUM PC VERDICT 9

FIGHT CLUB

Extremely comprehensive disc mastering suite, stable, and packed with useful features.

BUMFIGHTS

Skimpy documentation for secondary features, and sound editing apps are poorly integrated.

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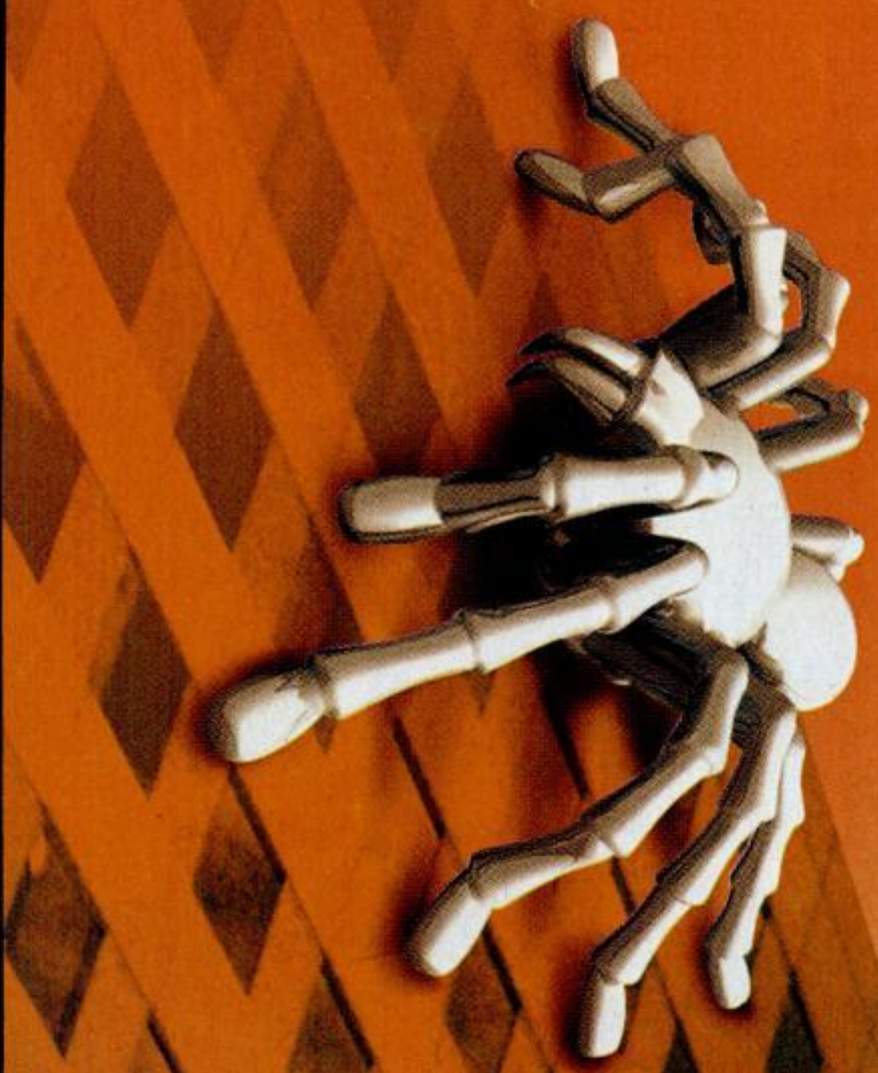

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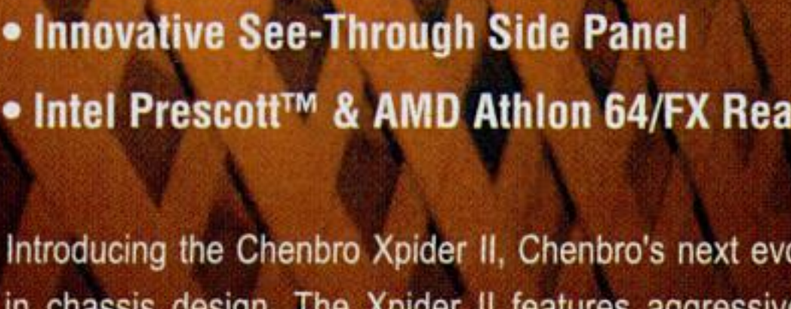

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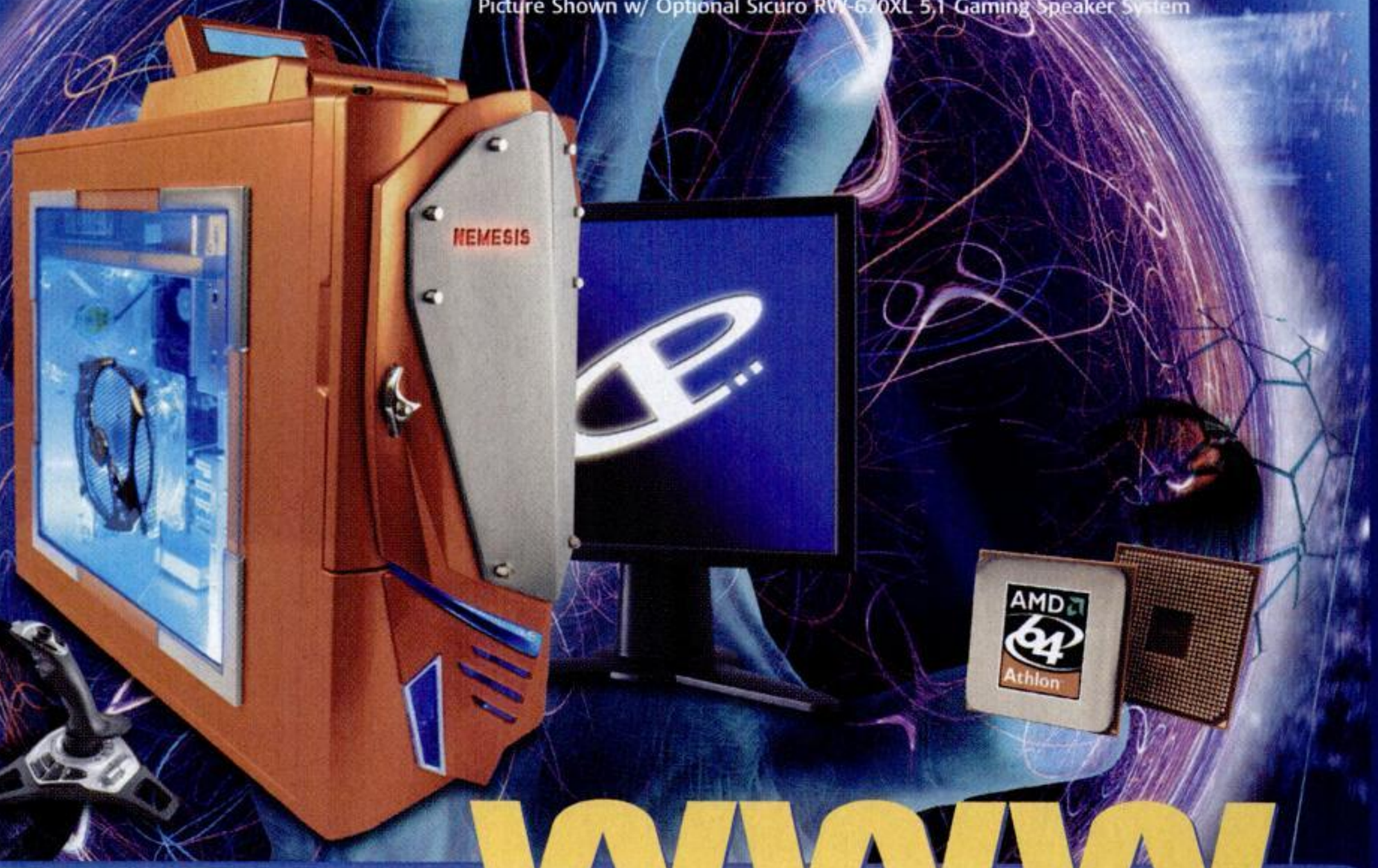

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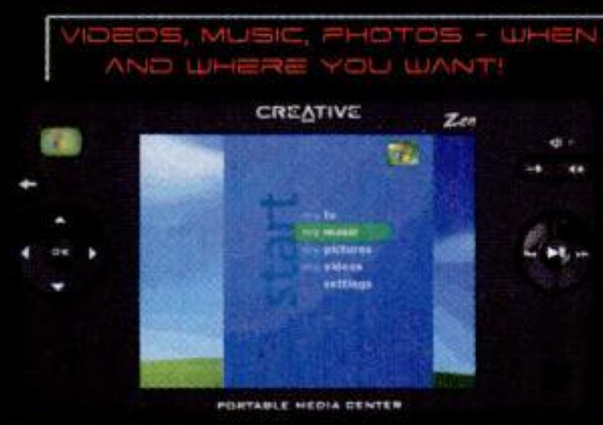

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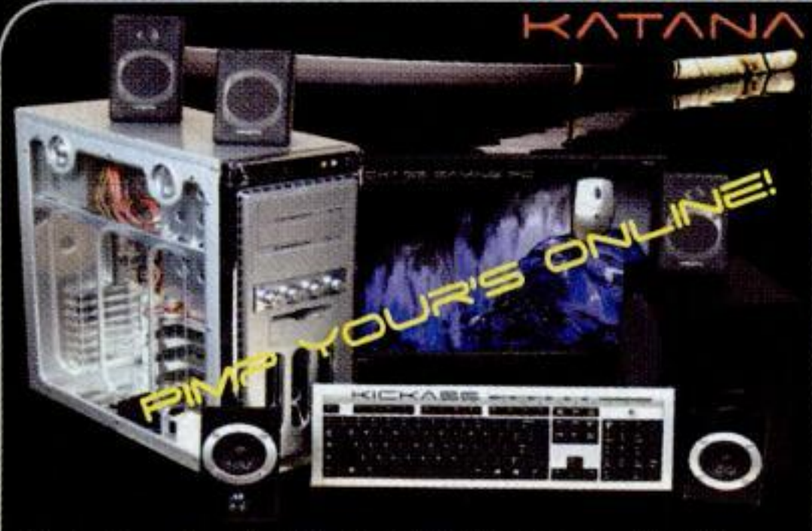

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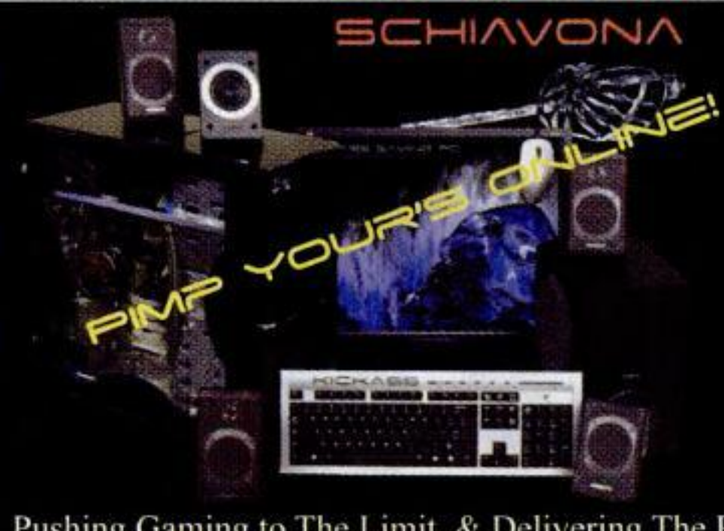

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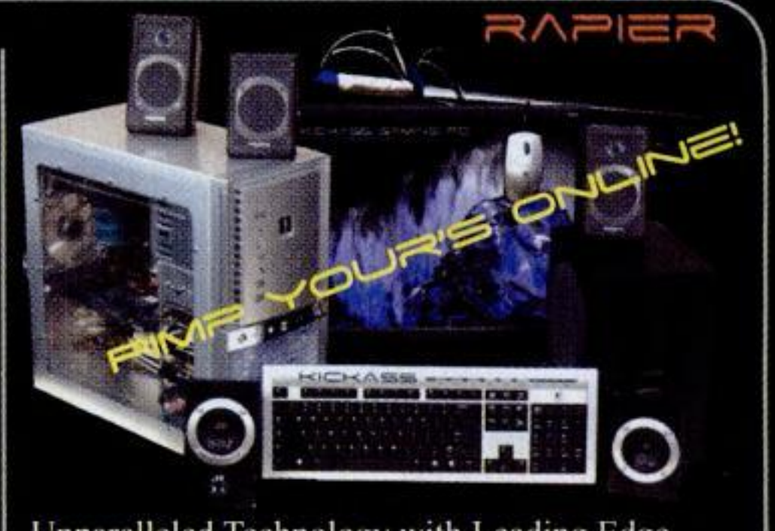

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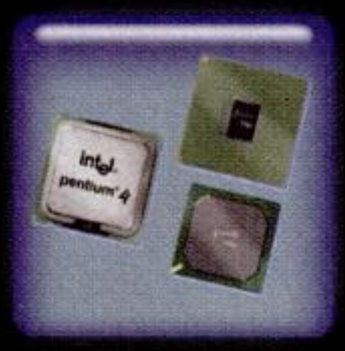

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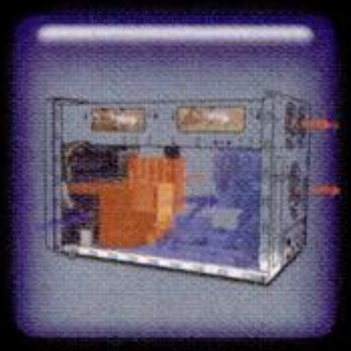

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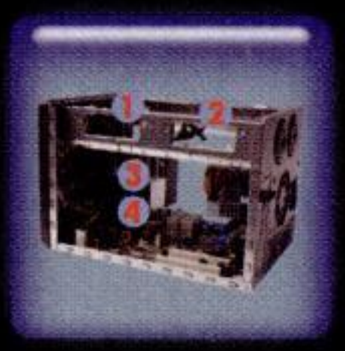

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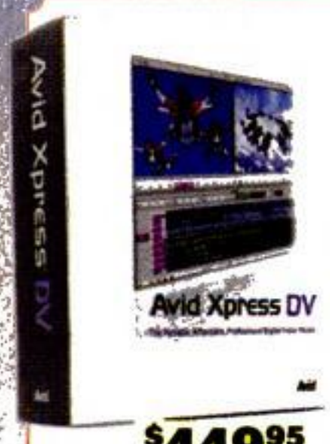

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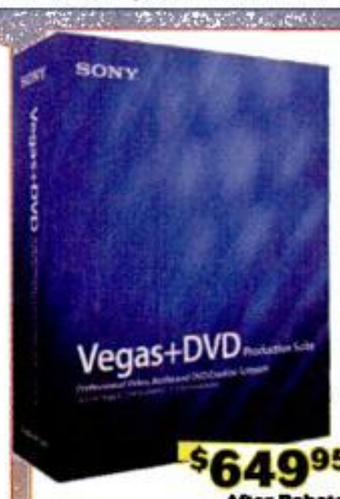

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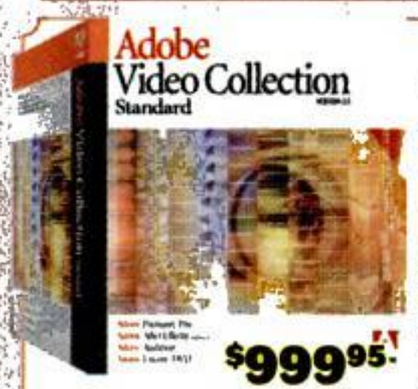

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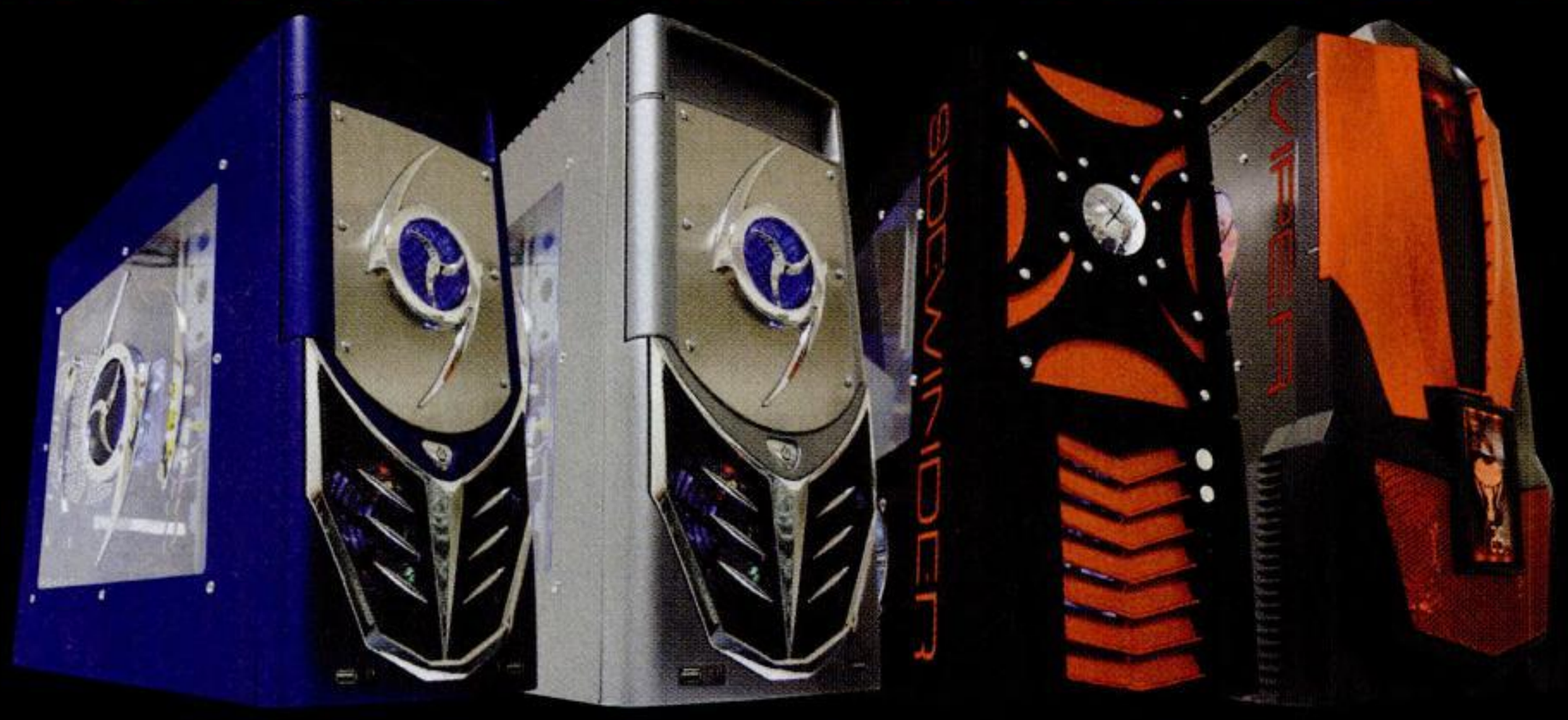

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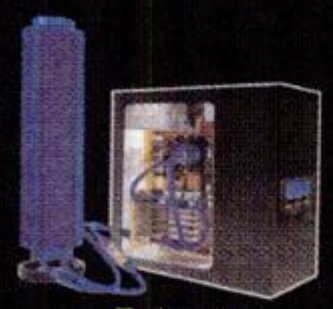
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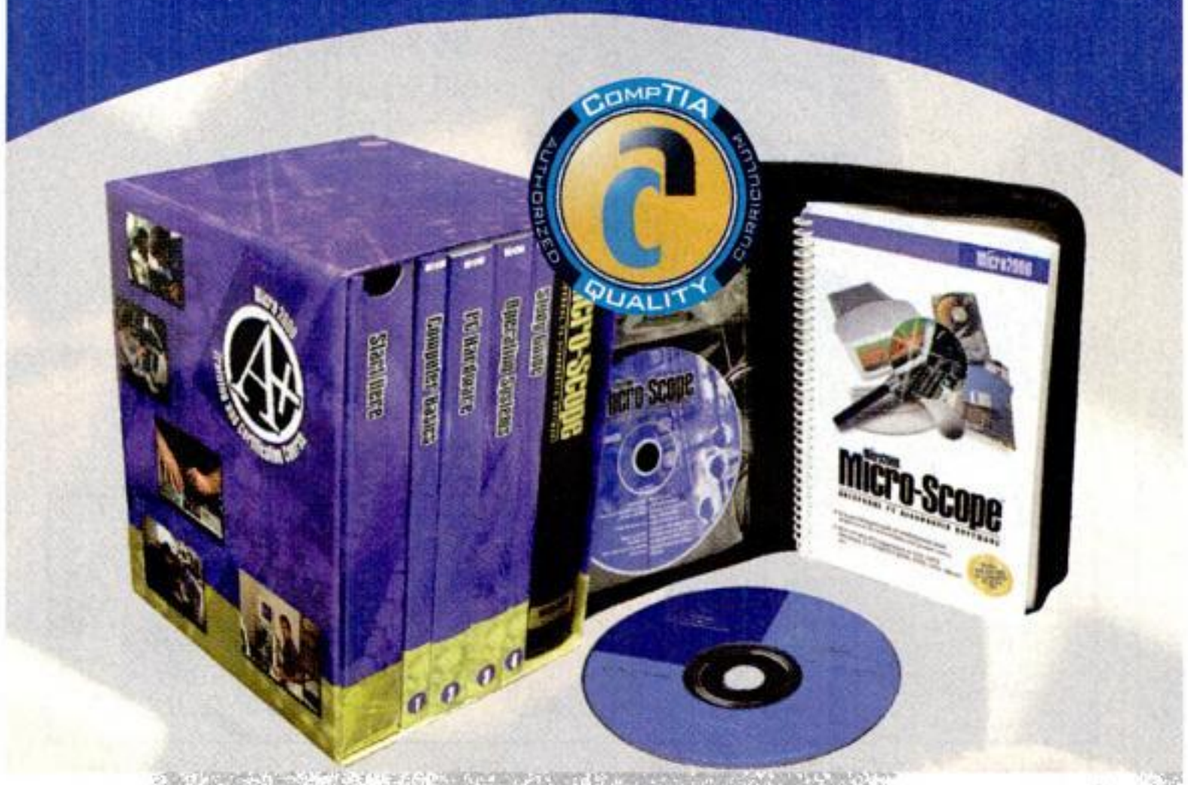

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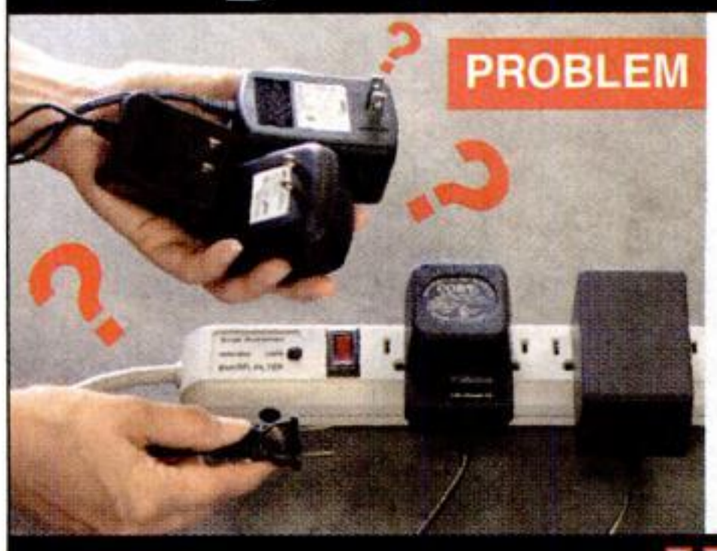

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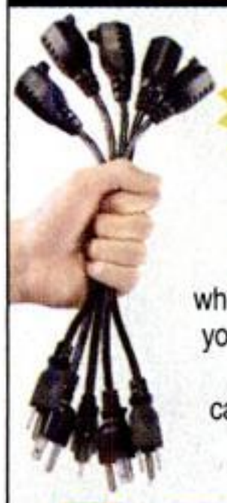

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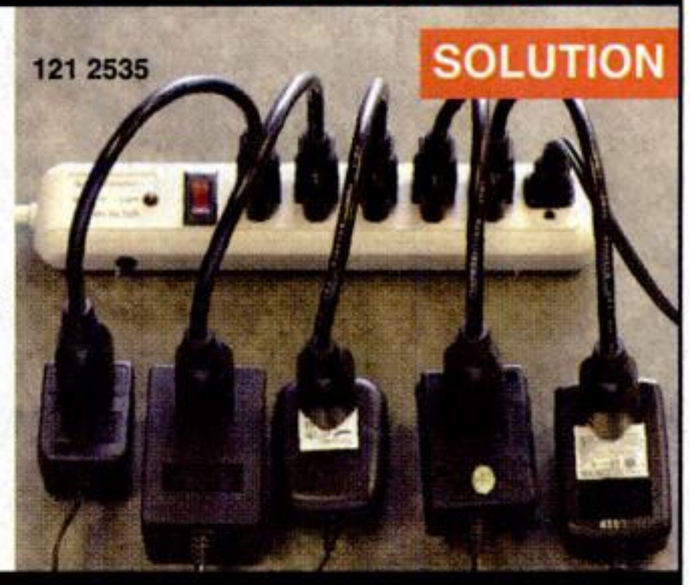

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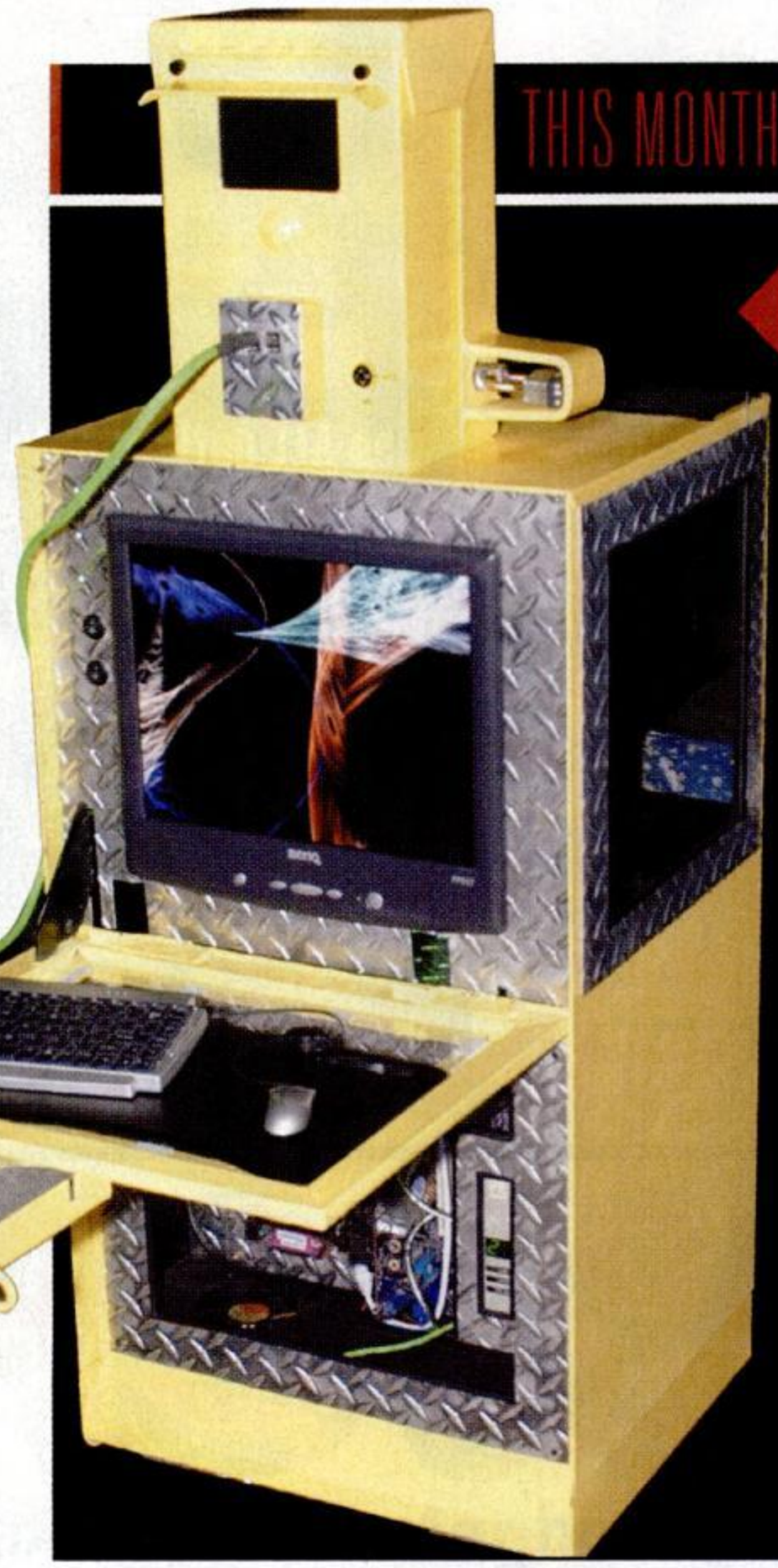
MAXIMUMPC Rig of the Month

THIS MONTH: Shaun McKinney's LAN Party On Wheels

Perhaps it was fate that led Shaun McKinney and his fellow Clan 42 mates to stumble upon an "old and broken" (that's their story and they're sticking with it) newspaper dispenser. It turned out to be the perfect housing for a custom rig they'd long been dreaming about—a rig that could accommodate an uninterruptible power supply, a rock-solid Linux server with quality hardware, and all the networking equipment necessary for an instant LAN party.

Of course, finding the dispenser was the easy part. The bodywork alone took months. Using a Dremel tool and countless disks, McKinney chopped away at the box, removing unwanted elements, adding windows, and even extracting a 65-pound block of concrete from the bottom.

Next, Bondo was applied to practically everything in order to smooth out problem areas and fill in the coin slots. That was followed by primer, then many coats of paint, and finally custom-cut diamond plate that was treated to look worn.



What used to be the coin box now serves as the home for five four-port switches (McKinney wanted to isolate major heat-producing parts from the mobo) and a Sony PSOne 5-inch LCD that provides system information.

The top half of the dispenser accommodates a 15-inch BenQ fp547 LCD, not to mention a handy keyboard/mouse tray. All the other gear is relegated to the bottom half, and still there's room to spare.

McKinney didn't have much trouble working with the relatively thin metal on the body, but the heavy-duty steel of the coin box was a different story.

6-inch pneumatic inflatable tires with heavy-duty casters make for a smooth ride. Mongoose bicycle pegs are attached to the back of the rig for steering.

The LED on the right reveals the goings-on of a 900VA UPS—a crucial component in the event of a breaker failure.

If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with high-res digital pics and a 300-word write-up.

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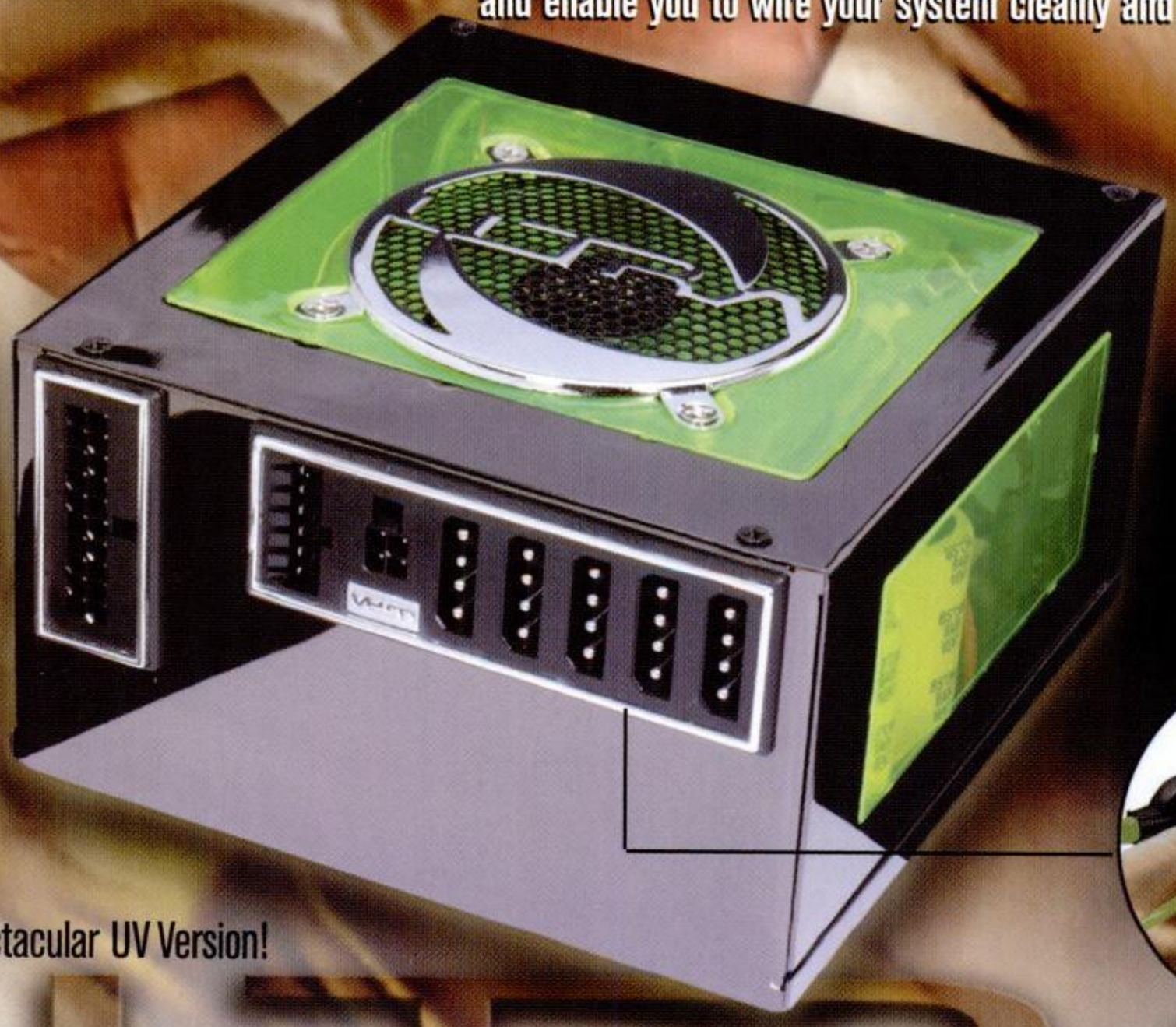

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